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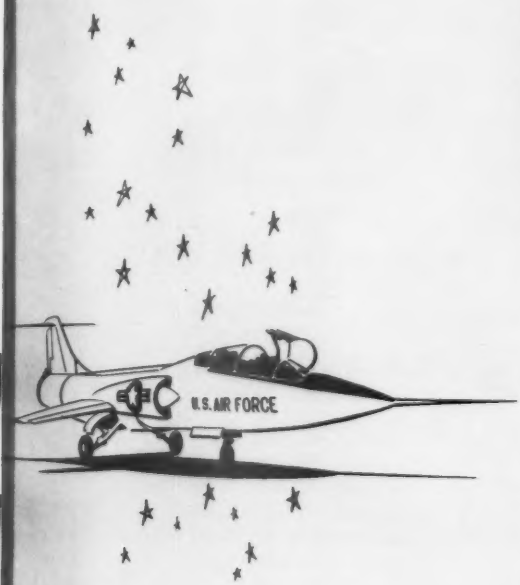
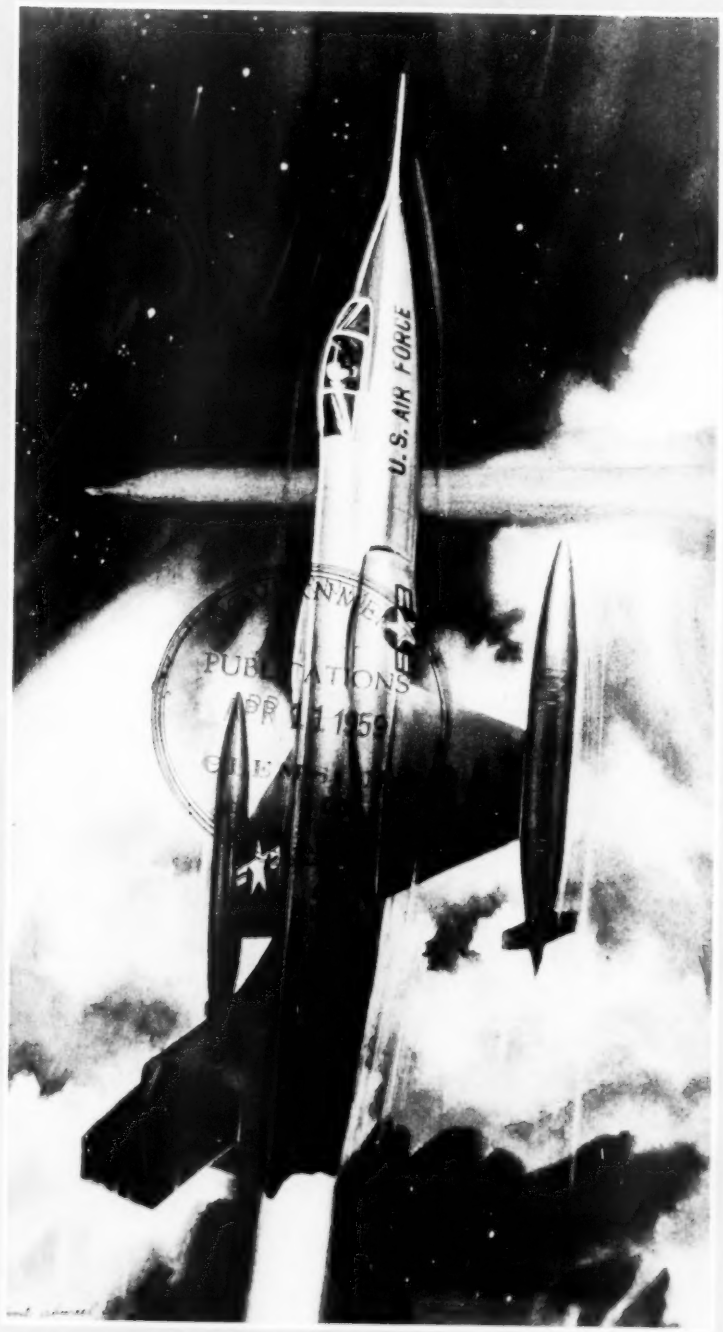
MARCH 1959

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE





CHOICE OF THE BOOMS

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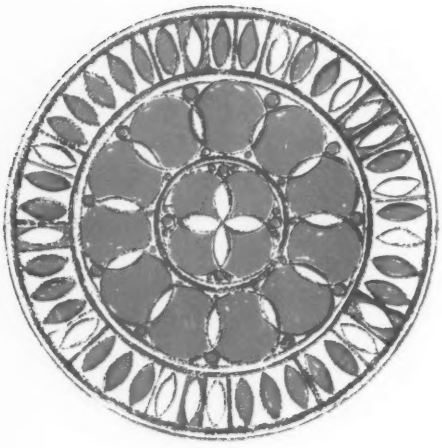

Easter Message

from Chaplain (Major General) Terence P. Finnegan,
Chief of Chaplains, United States Air Force

IF Christmas is a most Holy Day as we behold God born of Mary unto man's life, certainly Easter is the most sacred day as we behold Jesus born of a tomb so that man may rise unto God's life. Our faith in His Divinity is confirmed because He overcame death; our hope is enlivened because He has opened unto us the Gate of Eternity. Our Easter Day effort is to purge out the old life for the new and, as followers of Christ, now confess we have found Him.

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THE AIRMAN is primarily a medium for the exchange of ideas and information among Air Force personnel. Readers are encouraged to submit articles, short subjects, photographs, and artwork. All contributions will be given consideration; suggestions and criticisms are welcomed. Opinions expressed by individual contributors do not necessarily reflect the official viewpoint of the Department of the Air Force. All photographs are official USAF photos unless otherwise designated.

Use of funds for printing this publication approved by the Secretary of the Air Force and the Director of the Bureau of the Budget July 5, 1956.

Front Cover: From a painting, **"F-104 Starfighter,"** by Woodi Ishmael, Society of Illustrators, N. Y.

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE

VOLUME III, NUMBER 3 MARCH 1959

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Letters to the Editor

CLARIFICATION

Sir: *There has been a question arise at this station with reference to interpretation of the period to be covered in the first report required by AFR 36-10. According to instructions, the first report should begin with the date of entry into active service. However, in many cases, new officers attend school prior to receiving a duty assignment, and training, rather than effectiveness, reports cover this period. My question is, does the initial report, in such cases, begin with the date of entry on extended active duty or the date following the completion of the training report?*

A/1C Adryan H. Foss
APO 235, San Francisco, Calif.

Officials in the Career Development Division, DCS/Personnel, Hq USAF, indicate that the period of any report contained on AF Form 77 should begin with the date following the last day covered by the preceding report, whether it be effectiveness or training. The only report which should begin with the EAD date will be the initial report, and this may be either an effectiveness or a training report.

★ ★ ★

QUESTION

Sir: *What is the official United States Air Force fight song? Also can you tell me if we have an official hymn?*

A/2C Howard H. Ragan
APO 970, San Francisco, Calif.

The official Air Force music, generally recognized as the "fight song," is the *Air Force Song* which begins, "Off we go into the wild blue yonder . . ." This music was printed inside the back cover of the October '58 issue of THE AIRMAN. In the January '58 issue, inside the front cover, we printed words and music to the Air Force hymn, *Lord Guard and Guide the Men Who Fly.*

SUGGESTIONS

Sir: *I would like to make a suggestion for a future article for* THE AIRMAN. *I think you should consider doing a piece on the USAF's Veterinarian Service. Most people consider them solely as animal doctors and have no conception of the extent of their duties.*

M/Sgt. Charles A. Humes
Brookley AFB, Ala.

An excellent suggestion.

Sir: *Since Civil Air Patrol is a part of the Air Force, I am constantly surprised at the lack of knowledge of the program when I am around Air Force bases. I think* THE AIRMAN *should run an article telling of our job and organization.*

Edward Tanalski
Center Line, Mich.

CAP is not a part of USAF, it is an auxiliary. This in no way detracts from its importance as the aid and assistance which this organization gives is most valuable. For details on CAP, flip over to page 37 where its work is propitiously chronicled.

★ ★ ★

MOH INTEREST

Sir: *I rather suspect that the editors did not look too closely at the picture of Lt. Frank Luke which accompanied the story,* The Mystery of an Airman, *in the November issue. Either the negative has been printed in reverse or the prop on that airplane rotates in a direction opposite to those of today.*

A/1C Eddie M. Purvis
Scott AFB, Ill.

A check of the picture indicates that the negative is not reversed as the aircraft numbers are correct and Lieutenant Luke's wings are in the proper place. A more detailed check with officials at the National Air Museum solved the mystery. Early Spad aircraft did, indeed, have props which rotated in a direction opposite to that with which we are familiar. Although they could give no definite date for the change, they pointed out that both types are on display at the Smithsonian Institution in Washington. The earlier, a Spad-13, is of the type appearing in the picture on page 39. The Spad-16, a later model, has a prop which rotates in the "normal" direction.

Sir: *As Luke AFB, Ariz. is now one of the bases of 12th Air Force, your article on Lt. Frank Luke was most interesting to the people of this command. However, it has also created a bit of consternation in these parts. We are unable to locate Murvaux, the town near which this heroic flyer seems to have died. Can you aid us in our search?*

Maj. A. G. Thompson
Waco, Tex.

This proved to be a tougher problem than we anticipated. Neither the French embassy nor the French postal guide could answer the question. However, officials at the National Geographic Society finally came to the rescue. Murvaux does not show on most contemporary maps. It is a tiny town, northeast of Reims, a short distance from the Luxemburg border. The coordinates are: 49 degrees, 24 minutes, north: five degrees, 15 minutes, east.

★ ★ ★

Sir: *In the November issue of* THE AIRMAN, *in the article* Either Conquer or Die, *there is a very misleading statement. The author says that the first two Medal of Honor recipients were Capt. Eddie Rickenbacker and Lt. Frank Luke. In reality, Captain Rickenbacker was the fifth to receive his Medal, not the first.*

Jan Janis
Yellow Springs, Ohio

As worded, the statement is misleading. Lieutenant Luke was the first Air Force member to be *awarded* the Medal. Captain Rickenbacker's deed was the first to *qualify* although he did not receive his Medal until 1931. In the initial article of the series (*In the Name of Congress,* Sept. '58), this fact was explained, and the decision was made, before the series started, that the articles should run in order of the date of the qualifying deed. Captain Rickenbacker was the fourth, not the fifth, Air Force man to actually receive the Medal. Many assume that Lt. Edwin Bleckley was a member of an Air Force unit. He was assigned to an artillery organization. (See, *Airdrop to Immortality,* Dec. '58 issue.)

MORE ON LUKE

Sir: *I have just had the opportunity to read your November issue and was most pleased with the article on Lt. Frank Luke. I am enclosing a photo*

which was taken at the U. S. Cemetery near Romagne, France, on September 29, 1958, exactly 40 years after Luke's last flight. (See cut.)

Lt. T. C. Heine
APO 57, New York, N. Y.

★ ★ ★

Sir: *The series you have been running on Air Force Medal of Honor recipients has been most enjoyable. However, I would like to take issue with a statement contained in the January article concerning Lindbergh. It claims that Lindbergh was one of only two men to be honored with the Medal between wars. This is not so. I am aware of at least five Navy men who were also cited during this period. Rear Admiral Richard E. Byrd was so honored for his flight over the South Pole. Additionally, four petty officers were cited for crew rescue and subsequent salvage operations after the submarine* Squalus *disaster. They were Chief Metalsmith James McDonald, Chief Machinist Mate William Badders, Chief Boatswain's Mate Orson Crandall, and John Mihalowski, Torpedoman First Class.*

JOC Joe Oglesby
United States Navy

Chief Oglesby is correct. However, as no USAF member has ever been awarded the Navy version of the Medal of Honor, the original article of the series explained that all statements regarding the Medal and the men awarded this Nation's highest honor would be confined to the Army-Air Force version. We did not intend to slight these heroic Navy men, but we felt our original explanation would be sufficient.

★ ★ ★

THAPSMS

Sir: *In the December issue you published an article,* Tests, Tactics, and Techniques. *The story was most interesting, however, there are three places in which the base name is misspelled. I believe you meant Eglin, not Elgin AFB.*

A/3C O. V. Rollison
Palm Beach AFB, Fla.

You're right, we did mean Eglin. Curiously, in checking back into our files to determine who was the responsible party so we could mete out proper punishment such as thirty lashes, we discovered that the original copy, initial galleys, and page proofs were all correct. It was only after the story had been okayed to print that the mistake occurred. Obviously, either a thapsm (space-age gremlin) or a helpful, but misinformed linotype operator assumed that we had overlooked one of our own mistakes and decided to lend a helping hand.

★ ★ ★

NO ALTERNATIVE

Sir: *I have long been under the impression that NCOs with over 20 years' service are permitted to accept retirement in lieu of courts martial for minor offenses. However, I have been unable to find any such provision in regulations or find anyone to confirm this belief. Can you help me?*

Name Withheld

Sorry. All the sources we have discussed this with at this headquarters indicate they know of no such provision.

IN THIS ISSUE

Running the gamut from the first days of our budding Air Force, as recounted in *One Man Air Force,* to the present and future USAF problems as related in *Choice of the Booms,* we feel this issue will satisfy the reader's full range of interests.

This isn't always possible, as anyone dealing with the printed word well knows. In THE AIRMAN, we strive simultaneously to seriously inform and constructively entertain everyone from the airman basic to the chief of staff. Selection of the material is therefore governed primarily by a hybrid criterion of what will interest the readers and what they should know about the Air Force.

Assistance Unlimited, for example, is a story which should be a balm to our married members who are often whisked to faraway places, *sans* dependents. As the story relates, they can also go *sans* worries about their dependents' welfare. At the same time, *Marriage Mathematics* emphasizes that dollars and *sense* are important factors in any young airman's matrimonial plans.

Because it is a relatively young service, airmen occasionally believe the Air Force is shy of tradition. That this is contrary to fact is revealed in three short pieces dealing with history-making or tradition-establishing events during the youthful days of military aviation. *Perils and Plights of Pilots, One Man Air Force* and *The Day the Air Corps Bombed Hawaii* should prove that we, too, have our "Halls of Montezuma."

HOW YOU GET THE AIRMAN

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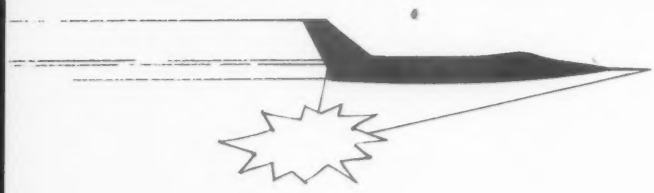


choice of the BOOMS

FOR AWHILE, as scientific studies of the sonic boom—disturbing by-product of supersonic flight — progressed in the laboratories of the Air Research and Development Command, the USAF hoped there would be some way out of a rapidly growing dilemma. Perhaps some hidden secret of physics or some unknown characteristic of aerodynamics design could rid the world of the annoying shock wave that drags the ground in the path of an aircraft exceeding the speed of sound.

Although hope still flickers, hundreds of letters pouring into the Pentagon continue to insist that something be done now about the sonic boom. Yet the sad, but undeniable facts of supersonic life are that nothing can be done to *eliminate* the boom, and the problem of *controlling* it grows more complicated daily.

Since 1950, the boom's appearance has grown more frequent and widespread as an increasing number of supersonic aircraft have become operational. The noisy ogre is scaring more people, causing more commotion, and appears to be less understood than ever before.

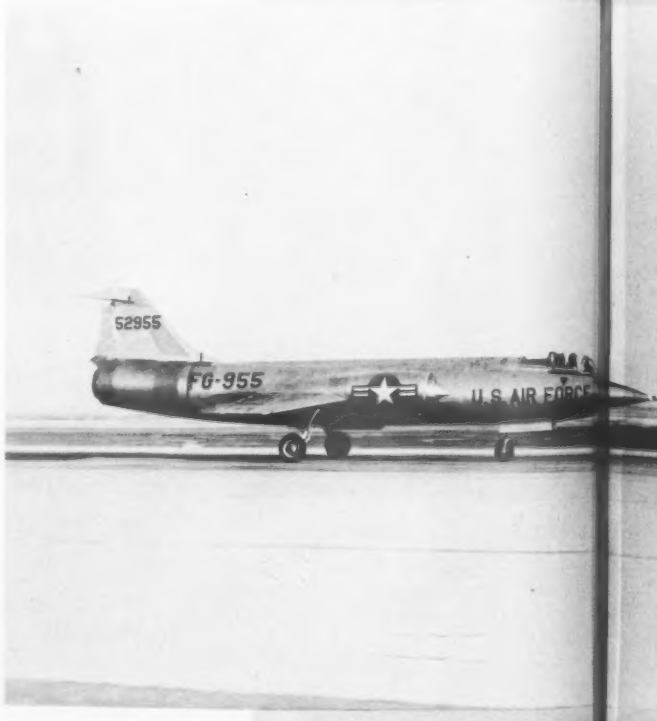
Until recently, the Air Force's answer to the problem was *operational control*. Because the magnitude of the boom or shock wave has a direct relation to the speed, distance (altitude), and size of the aircraft producing the boom, it was easy to impose flight restrictions on the slower aircraft without jeopardizing operational proficiency, and thus minimize the boom's effects. (See, *About the Sonic Boom*, September, 1957 issue of THE AIRMAN.)

Today, however, aircraft like the F-104, which in order to accomplish its mission must operate at supersonic speeds, make operational control a partial solution only. And upcoming are more such aircraft; the F-105, F-106, the B-70, and the B-58, which is already entering the inventory.

Does this mean that the Air Force can look forward to an infinite number of claim payments for damage purportedly caused by shock waves from its aircraft? Does it mean that the American public must continue to believe routine booms will cause periodic damage to property? The answer to these questions is an unqualified *no*. Damage from sonic booms was, is, and will continue to be an extreme rarity. Recent work done by Domenic J. Maglieri and Harry W. Carlson of the National Aeronautics and Space Administration's Langley Research Center has cast some light on the problem of the boom's power as related to aircraft still on the drawing boards. As an example, a future transport with a fuselage length of 208 feet will create a pressure wave of only slightly over two pounds per square foot (PSF) when it travels at a speed of Mach 3 at an altitude of 40 thousand feet.

The accompanying chart shows some practical examples of pressure and shock waves measured in pounds per square foot as compared to the PSF exerted by some every day noises. It can be seen that our theoretical transport boom is 10 to 15 PSF below that required to shatter glass and roughly 67 pounds below that required to damage even the flimsiest of structures.

But there is no escaping the psychological effects of the booms on people. They are frightening, annoying, and in many cases maddening. Thus, the dilemma the Air



by Capt. Ted R. Sturm, *USAF (Ret.)*

Nuclear or sonic? The Air Force can only present the facts . . . America must make the choice.

Force faces today: Either *sonic booms* must be accepted as part of the price of defense, or the heightened possibility of the *hydrogen booms* of global war must be accepted as the alternative.

To the uninformed, it might appear that the Air Force could restrict itself to flying areas where the resulting booms would not be heard. It could indeed, if the American public wants to sacrifice its air defense, dilute its offensive deterrent, impede scientific and technological progress, and lay itself open to conquest. So where does this leave the Air Force and the American people?

To Stay Combat-Ready

Aircraft of the Air Defense Command send up between 20 and 30 interceptors each day to check on unknown aircraft. As more and more ADC squadrons become equipped with the F-104, and faster aircraft, more and more of these interceptions will be at supersonic speeds. And the interceptions are actually only a small part of the ADC problem. Before a pilot can perform a supersonic interception, he needs roughly 20 training and transition flights in the F-104. Of this 20, 18 must be conducted supersonically. No matter how you handle it, its going to make a lot of booms. Yet would any thinking person advocate abolition of our air defense teams?

The B-58 *Hustler* normally cruises at subsonic speeds. But vital training exercises required to keep SAC at its top combat-ready peak, call for bomb runs by the *Hustler* at speeds of Mach 1 to Mach 2. The B-58 is a big aircraft. It's going to make a lot of noise.

The F-101 is supersonic. TAC, to maintain its posture as the major deterrant to small wars, must train its pilots realistically. This means supersonic flights in supersonic airplanes.

The list of aircraft goes on. Technological progress will bring faster aircraft to operational units. It is inevitable the sonic boom will become as familiar to Americans as the roar of jet engines and whine of automobile tires.

Learning to Live with It

Once people thoroughly understand the harmless nature of the boom they will lose their fear of it, perhaps even adjust to the inevitability of its presence. Despite the fact that the boom has been cracking around the country on and off for about eight years now, some of the false impressions that still exist border on the fantastic. Letters pouring into the Pentagon show that one of three major misconceptions underlie almost every complaint.

1. An aircraft must be diving to create a boom, therefore
2. All sonic booms are caused by hot-rod pilots playing games with their airplanes, and
3. Booms cause all sorts of damage from cracked swimming pools to wrecked buildings. One complainant even said a sonic boom broke his waterpipes, causing his house to become completely flooded. Others claim personal damage to ear drums and other parts of the body.

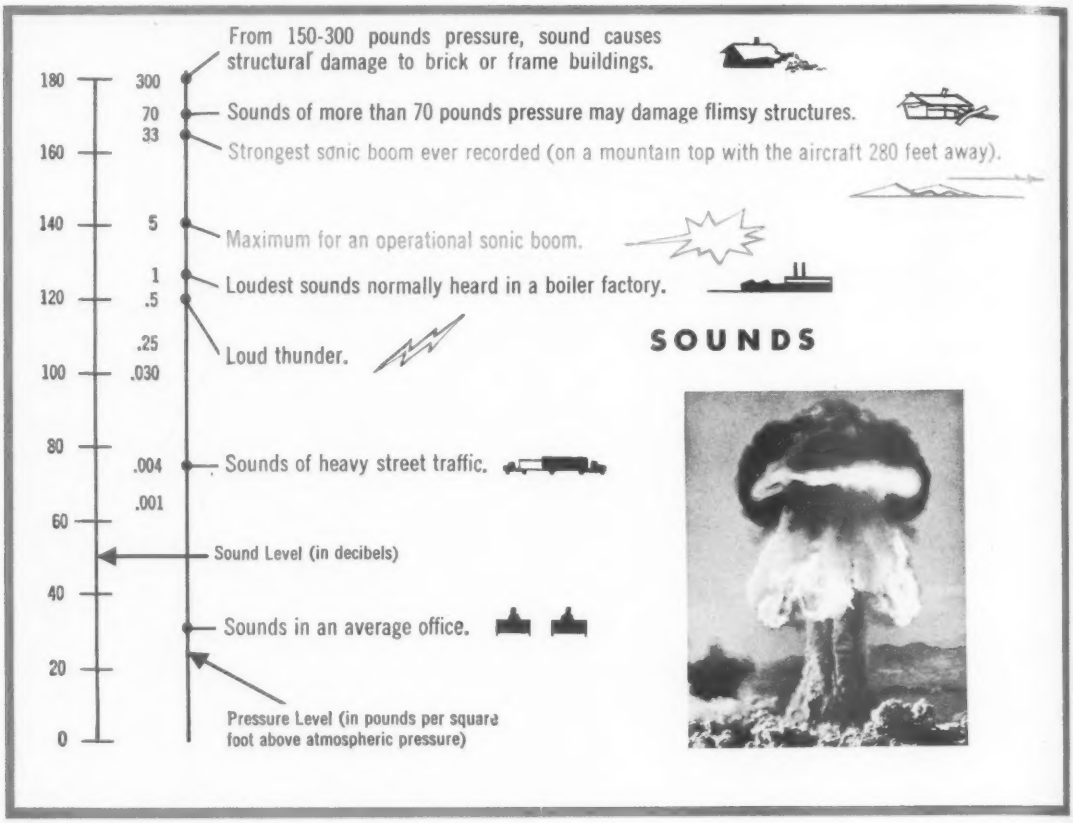
These three misconceptions are sufficiently important to warrant full discussion. It is essential that every airman, his dependents, and civilian employees understand the true nature of booms so that this phenomena can be accurately and consistently explained to the American public.

Diving

A diving aircraft will cause a sonic boom if it exceeds the speed of sound. In fact, any object exceeding the speed of sound, regardless of whether it is diving, climbing, or in a level trajectory, will cause a shock wave which may or may not be heard on the ground. Officials in the office of the deputy chief of staff for operations, Hq USAF, believe the misconception that an aircraft must dive to create a boom became widespread in the early 1950s, when our aircraft were by and large incapable of breaking the sound barrier except by diving.

The unfortunate implication of this misconception is that it leads into the second fallacy—the idea that Air Force pilots deliberately create booms.

That a sober-minded, serious officer, risking his neck to find out if an unknown aircraft is a possible enemy, would irresponsibly misuse a million dollars worth of equipment to make a noise is ludicrous. Were such a thing to hap-



pen—and admittedly there have been isolated cases—the offender would be liable to the most severe disciplinary action. With aircraft that operate normally above the speed of sound, the boom will be the result of the accomplishment of a mission; combat, training, or otherwise.

Damage and Injury

As far as bodily injury from the direct effects of a boom, medical authorities categorically deny the possibility. The largest boom ever recorded exerted a pressure of 33 PSF. (This from an aircraft traveling supersonically at 300 feet altitude.) To rupture the eardrums, a pressure of 500 PSF is required. To rupture the lungs, 864 PSF are needed. These figures, coupled with the fact that there is no record of any human injuries ever being incurred through the direct effects of the sonic boom, should dispel even the fears of those of faint hearts. Which brings up the possible exceptions. Booms are frightening; therefore it is conceivable that persons suffering any ailment which could be aggravated by fright might suffer as the indirect result of a particularly hefty boom.

Without delving deeply into the scientific aspects of structural damage from booms, it should be noted that the Air Force policy is to investigate all claims of damage allegedly resulting from booms. This investigation has a two-fold purpose: 1, to determine that a boom did indeed occur as the result of a supersonic flight from USAF aircraft, and 2, the damage was caused by the boom.

In the latter case, investigative findings are weighed against scientific knowledge. For example, claims for window or glass breakage, including bric-a-brac and other fragile items, are generally conceded to be justified. It is known that internal stress of glass, made more acute through installation, can result in breakage at less than 18 PSF—the pressure generally accepted by scientists to be necessary to break glass. Likewise, some plaster damage, and damage caused by loosely latched doors are honored, provided there is also a significant amount of glass breakage in the immediate area.

Because tests conducted at atomic testing grounds indi-

cate that 70 PSF are required to damage even flimsy structures the Air Force considers major structural damage to areas such as walls, foundations, beams, etc., to be highly improbable.

Relationships of Boom Variables

As discovered by Fred Daum and Norman Smith of the Wright Air Development Center's Aeronautical Research Laboratory, and further amplified and applied to contemporary and future aircraft by Maglieri and Carlson, there are several variable factors used in determining the magnitude of booms under given situations. These factors include ground reflection, shape and length of an aircraft body, its fineness ratio, speed, altitude, ambient pressures both at the aircraft altitude and at ground level, the distance to the maximum thickness along the body length, and the distance normal to the flight path.

Expressed in a mathematical formula, these variables reveal that atmospheric conditions can often keep a hefty shock wave from reaching the ground at all. This is particularly true in the case of a temperature inversion, where the wave will be reflected skyward before hitting the ground. Thus, no boom would be heard by those on the surface.

These variables make it possible to exercise some control over the boom, although it is inevitable that operations be conducted despite unfavorable atmospheric conditions. There is, however, one very important fact that is reassuring to the public. Above the speed of sound, any increases in the speed of the aircraft result in only slight increases in the pressure wave. For example, a given aircraft at 40,000 feet will create a boom of 1 PSF at Mach 1; at Mach 2 the PSF rises to 2, but at Mach 3, the increase in PSF is almost negligible—2.1 PSF.

Altitude is a different story. Decreases in altitude cause extremely high increases in the shock wave magnitude, but fortunately, most aircraft operate at extremely high altitudes when in supersonic flight.

These are the most important facts of this era of speed. Admittedly, glass will continue to be broken occasionally. Perhaps this can be corrected by understanding and care on the part of the people who install glass. Or perhaps broken window panes are a small price to pay for freedom.

"Don't Cuss at Them; Pray for Them."

So said citizen Leighton Templeton as he launched a one-man Prayers for Pilots *campaign.*

The home of Mr. and Mrs. Leighton Templeton is located not far from Portland International Airport where F-102 *Delta Daggers* of the 337th Fighter Group, ADC, rend the air with disturbing regularity. The Templetons are an elderly couple, quiet and retiring, but apparently rich in the wealth of human understanding.

Last September, the *Oregon Journal* of Portland published a letter to the editor from Mr. Templeton on the subject of jet noise. Oddly, it contained none of the vitriol and brimstone that might have been expected. This letter was different. It described how Mr. Templeton and his invalid wife had "overcome the upsets of jet noise" by saying a small, silent prayer for the airmen overhead each time a plane came within hearing.

In December, Mr. Templeton wrote again to the editor to tell of the surprising and far-reaching effects of his first letter. "I have heard from people all over Washington, Oregon, and California—as far south as Los Angeles—telling how much they endorsed our idea of a prayer for the pilots. It is amazing how so many have welcomed this unusual invitation to pray for the well-being and safekeeping of another. Now we are writing many more letters to people we think can help. It is good to know that a civilian can do something to help the Air Force."

Col. Younger A. Pitts, commander of the 337th, and Lt. Robert E. Ryan, his information services officer, read the letters in the *Oregon Journal.* From them the story made its way to NORAD headquarters, to the Pentagon, and to THE AIRMAN.

Here is something which should be encouraged to flourish and grow. Here at last is a program in which inflation can be heartily endorsed by all concerned.

Assistance Unlimited

A bridge of helping hands

by Dave Karten

"An effective Family Services Program recognizes the complexities of military life and the difficulties involved in coping with problems while in service. It offers maximum assistance in their solution."

General THOMAS D. WHITE
Chief of Staff, United States Air Force

ONE week last September the Chinese Communists' massive bombardment of Quemoy became a personal matter to 123 Air Force wives at Hamilton AFB, Calif.

In a swift move that demonstrated its global mobility, the U. S. Air Force began airlifting F-104s—short range high altitude Mach 2 interceptors—by C-124 *Globemaster* to strengthen the Pacific Air Forces' defense of the Republic of China. Overnight the wives of the *Starfighter* pilots and ground crews became "TDY widows."

For many of the dependents this was the first family separation for an extended period. Some of them faced the prospect of several months alone with misgivings. What would a wife do if confronted with special problems? In many cases where she lived off-base, she might be alone in a strange city among strangers.

But she was *not* alone. Quickly a group of volunteers went into action to offer assistance. Next day, as California temperatures soared close to 100 degrees, Capt. Mina Costin, the officer responsible for the base family services program, and Mrs. Bette Van Meeker, a volunteer Air Force wife, drove 50 miles to the Travis MATS terminal, takeoff point for the move, to check names and addresses of the girls left behind. With other volunteers they spent the long hot weekend typing letters and offering assistance in any way possible. Before another weekend rolled around the "SOS calls" started coming in. They ranged from transportation requests and landlord trouble to serious emergencies.

"I needed someone to take care of the children when I was hospitalized for five days," said one TDY pilot's wife "Family Services helped me. I don't know what I'd have done without them."

All during the TDY there was no slackening of assistance effort. Family Services made arrangements for the stay-at-home wives to keep in touch with their husbands on Taiwan through the cooperation of local "ham" radio operators and the MARS radio station on the base. Every effort was made to relieve the dependents' anxieties caused by their husbands' sudden departure. Just as soon as a problem arose, it was handled with dispatch by volunteer Air Force wives seasoned to service problems through their own personal experience. "It's a great comfort," wrote Mrs. Dora Bennett to her husband on duty in the Far East, "to know I have someone to turn to in the event of an emergency."

These are typical examples of how Family Services, a global volunteer help program run by Air Force wives

The children have a chance to unwind at Family Services "Kiddie Korner" while mom and dad are briefed on the base facilities. Emergency baby sitting is one of the important services rendered by Family Services volunteers who care for the children as if they were their very own.

under USAF sponsorship, daily helps solve some of the problems peculiar to Air Force life.

Last fall, an aircraft from Donaldson AFB, near Greenville, S. C., crash-landed at another base and several crew members were critically injured. Family Services immediately sent a team of baby sitters to care for the children of the personnel involved, while other volunteers drove the wives to an airport. During the next few days, with the mothers away, good samaritans in Family Services cared for the children as if they were their very own.

One baby sitter voiced the sentiments of all the Air Force volunteers in the program. "When you think about it," she said, "they *are* our own."

Family Services (originally called Dependents' Assistance) is now an official Air Force program. But for many years it was carried on by hundreds of dedicated volunteer Air Force wives and had no official status.

How It Began

The need for Air Force family assistance dates back to World War I.

In 1917, air bases were relatively small and few; many flyers were virtually cut off from their parent organizations and families. Off-duty hours offered little entertainment.

Even with the excitement of a new form of warfare, the morale of the "baling wire and fabric crate" airmen suffered due to the lack of contact with the outside world.

There was continual concern for their dependents; what they were doing, and how they were getting along.

In 1920 some dependents in the Washington, D. C., area organized the "Air Services Wives Club" to look into welfare problems and call on hospitalized personnel. That club was the grandmother of the Dependents' Assistance program. This interest continued and became more organized through the years, and its value finally brought Air Force recognition through provision for a Dependents' Assistance program in personal affairs directives.

Many bases had "some kind of a program," but most functioned only during mass TDYs and suffered due to lack of military supervision. The type of aid given airmen and their families at one air base had little or no resemblance to that found at another base. Obviously what was needed was an Air Force-wide program that would insure an adequate measure of assistance to Air Force families no matter what base they were transferred to in the U. S. or abroad.

General Curtis E. LeMay, then SAC Commander, was very much concerned about the problems faced by families when airmen were deployed overseas, often on short notice, in SAC's intensive mobility training program. The Korean conflict, with its short-notice mass TDY movements also underscored the need for aid to the family in the temporary absence of the head of the house.

General LeMay's plan to ease the problem was designed to "keep the home fires burning" despite these frequent family separations and in 1952 he asked Eighth Air Force to develop and field-test a Dependents' Assistance program using dependents as volunteers.

In 1953 the Eighth submitted its evaluation of the test and General LeMay decided to develop an expanded Dependents' Assistance program in SAC. A special committee of wives, headed by Mrs. LeMay, was appointed to study the assistance available at various bases and aid in developing an effective program.

They concluded that to be effective a DA program must operate under military control and coordination, rather than independently under volunteer groups; that additional spaces must be authorized for qualified officers at all levels to provide guidance; that a well trained volunteer group was needed and that command support was essential.

The Air Force, with all the rapidity of its growth, knew that the ability of its airmen to carry out its mission in the most effective manner depends not only upon training and mechanical efficiency of equipment, but also on an individual's peace of mind. Recognizing this human element in 1948 it set up a requirement for the personal affairs officer on each base to keep in touch with dependents during the absence of their husbands and to assist in every possible way. This method proved only partially effective, however, because it lacked military manpower and organization.

"We're a new service," Mrs. Hoyt Vandenberg, wife of the Air Force Chief of Staff at that time told the Washington Air Force Officers' Wives Club in 1948, "and much can be done to improve morale through personal aid on a local basis."

By April 1954, SAC had established a command-wide DA program and last May Air Force made it USAF-wide by issuing AFM 34-7.

This manual changed the name to "Family Services" and established this assistance and Family Services Centers as a responsibility of the base commander. The program is monitored by an advisory council which meets regularly to review and formulate plans, and set policy.

The council consists of the base commander, wing commanders' representatives, chaplain, personnel officer, information services officer, base surgeon, personnel services officer, personal affairs officer, volunteer coordinator and assistant.

The Family Services Officer at each base is responsible for implementation of all phases of the program. He also conducts an orientation course where wives learn about Air Force benefits, services, and facilities available to them, including the Family Services program itself. Many of the wives attending the course volunteer for FS work, in which case they receive further specialized training in various committees.

There are two broad categories of committees: emergency committees subject to call 24 hours a day, and scheduled committees which normally work during regular duty hours.

Volunteer workers are assigned to one of the many different committees. One group deals with casualties, a committee no one wants to see in action. The volunteers in this case, chosen for emotional stability, help ease the shock of a casualty report. They stand by, if needed, until relatives or friends arrive. They are ready to take over care of children and of the home, and to handle the difficult details facing the family.

Other emergencies are handled by a personal services committee. These offer taxi service, do baby-sitting, and provide many other helpful services as needed. When possible volunteer workers handle emergencies themselves; at other times they refer problems to the Family Services officer to be dealt with through military and community agencies.

In each case, be it medical aid, financial aid, allotment assistance, or liaison with other on-base facilities, the FS office monitors all contacts to insure that the services required to alleviate the problem are provided. No request is too large, too small, or too unusual for Family Services to tackle.

These committees are the backbone of the assistance organization. To find out just how they operate, let's look in on the Family Services Center at Williams (popularly called "Willie") Air Force Base, Ariz.

You've just completed the last leg of a 1,200-mile drive to your new duty station. You've driven a day and a half through flat prairie country where the road lay ahead like a ribbon to infinity. You've crawled along for hours

←

Reporting in at Williams begins with an invitation to come in to the Family Services center where you can relax. Inside, a friendly welcome and a cup of hot coffee make you feel right at home.

→

Mrs. Curtis E. LeMay, one of the original organizers of the Dependents Assistance (now Family Services) program, instructs volunteers in an orientation course.

through cloudbursts when you couldn't see more than 15 or 20 yards ahead of the car.

Your fuel pump goes out in the mountains and you've changed two flats in the desert heat. The children are crying and your wife's worn out. You're pretty tired too as your family chariot comes to a halt at the main gate.

You're issued a temporary vehicle pass and the AP hands you a map of the base and a letter of welcome. "Check with Family Services," he adds, "it's in building S-13."

"Here we go again," you grumble to yourself. "Looking for a place to live, sweating out the shipment of household goods, hours of in-processing records, running all over the place filling out forms, and everything else that goes with a change of station."

You find building S-13 on your first try. That's a switch. Something's gone right for a change. You maneuver the car into a parking spot while the wife settles down to pacifying the children for the inevitable long wait while you're inside finding out what happens next.

"Bring the family," pipes up the seven-year-old. She's been reading you every billboard along the road. And sure enough that's what the sign says. "Welcome to Willie and bring the family in." You and your wife are pleasantly surprised when you enter S-13. You're greeted by one of the friendly volunteer workers on the FS welcoming committee. You're given a hot cup of coffee, and a chance to just relax and catch your breath after the tiring trip.

And the children, who have been storing up more nervous energy with every mile along the way, have their chance to unwind at last in the center's "Kiddie Korner" under the watchful eye of a volunteer.

Because housing for the new family is a primary consideration, Family Service's housing committee maintains up-to-date listings of all available housing in nearby communities. They keep files on the average cost of utilities, location of churches and schools, and transportation and recreation in the area. Another corner of the center houses the "Pots and Pans Loan Locker" where the family can borrow anything from utensils and dishes to an electric iron or a playpen.

If Junior is hungry, there's a supply of strained vegetables on hand in the well-stocked refrigerator. A copy of the base guide and schedules of operating hours at the base exchange and other facilities are provided every new family during their initial visit to the center.

If travel expenses to the new station have strained the family budget during the trip, FS will help arrange expeditious receipt of travel pay or even advance pay to tide your family over until the regular checks start rolling in again.

Even after the family is settled in its new community and complete readjustment has been made to your new surroundings, FS continues to make available family assistance in a variety of forms. In addition to the dramatic type of aid rendered when an Air Force family is in distress, there is routine assistance; for example, budget counseling, estate and insurance planning, etc. The center maintains an active file of baby sitters, maids, seamstresses, and items "wanted" or "for sale."

When the time comes for the airman to leave Williams for another station, Family Services will advise his family of local conditions at the new base. Complete files are

kept on every stateside and overseas base, with current information on the surrounding area, available housing, cost of living, climate and appropriate clothing. Maps of the new base are available and the volunteer on duty can brief the family as to location of the base's principal facilities. If the family is headed overseas, appropriate passport or visa arrangements are also handled through the Family Services Office.

One of the unique things about the program is that no funds are provided for it. When a member volunteers to do emergency baby sitting, for example, she uses her own car for transportation. When household equipment is needed, it is loaned by the FS center from a supply of furnishings donated by individuals, wives' clubs, and local merchants.

A service frequently performed by Family Services is helping to find temporary or permanent housing on arrival at a new base. They arrange it so that when an airman and his family arrive at their new base, they can move right in.

Mrs. R. C. Voll, Family Services volunteer at Offutt AFB, Nebr., receives a service stripe from Col. William R. Campbell while Mrs. Ted Egan, assistant coordinator, looks on.

Family services by no means excludes consideration of the single airman. One of the problems confronting unmarried student officers at Williams, for instance, is locating suitable housing for those who live off-base since the area is crowded with winter vacationers from all over the country from March through November. FS helps them in every possible way.

Nor is the service limited to families of active-duty personnel. Continuous liaison is maintained between Willie's center and the more than 30 widows of Air Force men who reside in the local area. Personal calls by the volunteers keep them well advised of changing Air Force benefits that might affect their status. They periodically receive news bulletins from the center about activities at the base or social affairs to which they are all invited.

Assistance Unlimited

When an emergency call comes in the FS center reacts instantly. Last April Mrs. Carole Ann Krupinski, wife of an Air Force officer stationed at Burtonwood, England, was driving on a New York State thruway with her six-month-old daughter when she lost control of her car. The vehicle ran off the road and overturned. Miraculously, neither she nor her daughter was hurt. Stranded miles from home in raw windy weather with a wrecked car, a young baby and little money, she called the Family Services center at Stewart Air Force Base, about five miles away. What could she do?

Let Mrs. Krupinski relate the rest of the story: "Although I was a stranger to the base, Family Services reacted immediately to my call for help. They took care of everything and four hours after the accident we were on a train headed for home. They arranged an emergency Red Cross loan by telephone so I would have enough money for food and transportation and took my wrecked car to the nearest car agency for repairs."

When asked why she called Stewart AFB for assistance, Mrs. Krupinski explained that although she was in a state of shock after the mishap, she remembered that the base was nearby and knew Family Services assists dependents in an emergency.

At Ben Guerir, North Africa, recently, a doctor at the base hospital notified Family Services that a sick infant required Starlac and that none was available in the commissary.

The FS center broadcast an appeal over the local Armed Forces radio station. Within an hour 25 Air Force wives called in offering to donate the needed milk and volunteers delivered it to the baby.

At Whiteman AFB, Mo., volunteers took over when the stork caught up with a sergeant's wife on a California-bound bus. They rushed her to the base hospital, alerted Red Cross to notify the airman at his east coast station and took care of the year-old big brother until mother and daughter were released from the hospital.

A family of eight, hastily flown from their overseas base to California so that their sick child could be given special treatment at San Francisco's Letterman General Hospital, needed basic furniture for the house they had rented. FS delivered it within 24 hours.

At several bases FS operates an "Around the World Club" for foreign brides to help them get settled in their new surroundings and accustomed to the American way of life. Not long ago the young Japanese wife of an Air Force Sergeant arrived at Charleston AFB, S. C., with quite a problem. The strange country, strange customs, language barrier, and small baby—her first—were too much for her to cope with. Family Services volunteers contacted another Air Force wife of Japanese extraction who spoke English well and helped her get settled in short order.

Hardly a day goes by in which some airman or his wife doesn't call on Family Services for help. In every case he receives intelligent assistance, both helpful and understanding.

The Air Force has come a long way since World War I. No longer do families live in doubtful concern. Today, that uncertainty has largely vanished. Thanks to the support and untiring efforts of Family Services the well-informed dependent of today takes TDY family separations in stride, with assurance and a sense of security reinforced by the knowledge that the Air Force takes care of its own.

in my opinion

Before you tie the knot, do some basic figuring with . . .

MARRIAGE MATHEMATICS

by Chaplain (Major) Ben G. Hoffmann
Barksdale AFB, La.

(Editor's Note: *Chaplain Hoffmann, who wrote so perceptively in the October issue on "Career Field—Marriage," presents here another important aspect of matrimony.* THE AIRMAN *believes he has a vital and sobering message for airmen planning to marry.*)

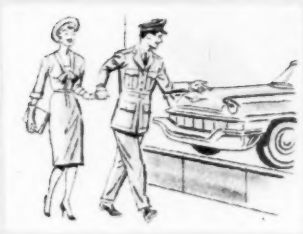
So YOU want to get married? That's a noble purpose. God so intended it when he said, "it is not good for man to be alone," and the same is true of woman. But before you "pop the question" and set the date, there are some very practical problems which you should consider. Whether you like it or not, you must think of them even before you and your best girl think of marriage—and definitely before you run down and get the license.

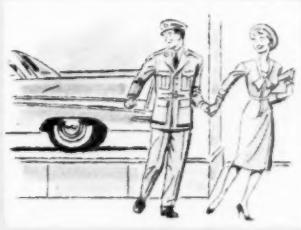
Answer this very vital question: Can you *afford* to marry? Can you foot the bill?

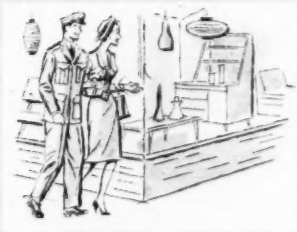
When a man marries he assumes certain responsibilities. Chief among them is that of supporting a wife. That takes money. When one marries, the essentials of life are doubled—to say nothing of the way that families have of becoming larger which increases the expense manifold. True, your generous Uncle Sam goes along part way in this project by granting an allotment which falls short of doubling your salary, but increases the *money* you get.

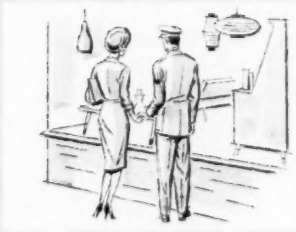
While single you get part of your salary in food and lodging. What Uncle Sam does is this: the money he has been using to feed and house you will now be turned over to you to give you a whirl at feeding and housing two people. Dealing in round numbers take, as an example, an airman second class who receives a total of $208.00 including his allotment. (Incidentally, if you owe any money at all you will also have to take it into consideration during this course of "marriage mathematics.")

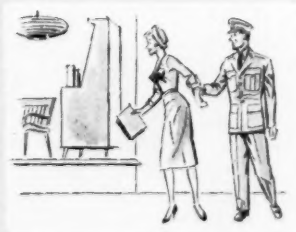
On the basis of years of study (not the author's), it has been pretty well established what percentage of your pay should be allotted to the











various expense columns of married life if you want to make both ends meet. It runs like this:

	Percent	Portion of your salary
Savings	10	$ 20.80
Taxes	6	12.48
Food	30	62.40
Maintenance	32	66.56
Clothing	12	24.96
Advancement	2	4.16
Health and personal care	6	12.48
Recreation	2	4.16
	100	$208.00

There you have it—neatly lined up in little figures which will require a little explanation and expansion. Unless you have another source of income, the amount stated above is all you will have and you will find it necessary to spread it pretty thin if you hope to cover all the ground. Let's look at the work expected from $208.00.

Diminishing Returns

First, there is the matter of savings which can include life insurance. Everybody should put away something for the future—for the unexpected "rainy day" or for some special purpose. The experts say 10% or $20.80. We cannot go into detail on the many advantages of a savings account. They should be quite obvious. Saving should be a practice acquired while you are single and your expenses are at a minimum. It is far better to enter marriage with a savings account than to enter it with debts.

In the matter of taxes you get somewhat of a break because there is no tax on your quarters and rations allowance. But on the above salary you will still pay $2.70 withholding tax and $2.80 social security tax, which Uncle Sam takes and puts away for you even before you see the money. Your tax total will be only $5.50 instead of the $12.48. That's like finding $7.00, but please don't use it on the "easy come, easy go" principle. Hide it somewhere. You'll need it.

You have now accounted for $26.30.

Next, look at the item food. The budget says: $62.40. Do you have any idea what it costs to feed two people when every bit of food must come from the store or the commissary? Most single men do not. There is some excuse for this ignorance in that they have never been faced with the problem of buying and paying for food for two people. But that is no excuse for remaining in ignorance and shutting your eyes to the truth. Take your girl for a walk through any food store and look at the price tags. Do you know that if you are a reasonable coffee drinker (1 cup per person three times a day) that a pound of coffee will last about two weeks at close to a dollar a pound? You won't find much room in the budget for steak, choice roasts, or *any* caviar. You will have to do with a good portion of hamburger and cheaper cuts of meat with many so-called "economy dishes."

One thing you will learn for sure. There is nothing in this budget which will permit you to "eat out" or to have much "eating company." Uncle Sam says that it costs him a little more than a buck a day to feed one man and he buys in tremendous quantities which gives him cheaper prices than you will ever be able to get. After you look back on what Uncle Sam gave you to eat on that dollar a day, you will finally be convinced that he did a pretty good job even though you might have complained at times. Be assured that even on bargain days at the local supermarket, you won't beat the price that Uncle pays for his food. Look at that $62.40 again. Not very big when two people must eat on it for 30 days. You get a break in February—but you'll have to stretch it over an additional day 7 months of the year.

That takes care of $88.70.

Then comes *maintenance*—$66.56. First of all, think of the *big* item: a place to live. It is called *rent*. Uncle Sam isn't going to run you out of the barracks, but you better get out if you want to live with your wife. Experience proves that $66.56 is not going to get you very much in the way of a furnished apartment. In fact, it won't get you very much in the way of an unfurnished apartment. If it is unfurnished, what are you going to do about furniture? Do you have furniture already bought and *paid* for? If so, you are the exception. If not, you will have to look for a furnished apartment. Don't say that the whole problem is solved because you are going to move in with the "in-laws." (Incidentally, "in-laws" are hazard number two on the road to a happy marriage. The one you're reading about is hazard number one.) If you can find a furnished apartment for the price quoted above, be sure and ask another question: does the price include all utilities—light, water, gas, telephone? You can't sit in the dark all the time. Your wife will want to cook your food and wash your clothes. Having each other's love to keep you warm doesn't quite make up for lack of heat in an apartment. Look again at that $66.56.

A furnished apartment which includes all bills won't look so glamorous after the first couple weeks. If you want something unfurnished and with bills unpaid, you must find a place less glamorous still and save what you can for furniture payments and utilities. If you borrow from one account, that account has just so much less to go on. You don't make the string any longer by cutting a piece off one end and tying it to the other.

So far you have used $155.26. Goes fast, doesn't it?

Now then, how about clothing? $24.96. At the beginning that looks big. Why, the young lady will come with a complete wardrobe (you hope) and you also will be saving your Sunday best. But clothing does wear out. It must be replaced. Nobody can say just how much clothing will cost you. These figures simply say that *all* you can allow for clothing is $24.96. If you don't need that for the first month or two, put it aside for the day you will. If you don't put it aside, you will be in for rough times when "mamma needs a new pair of shoes or a coat or a dress." Both of you should have a reasonably good idea of clothing costs. If you and your prospective bride feel that you must always be dressed in the latest fashions, or have complete changes for every occasion—you are headed for disappointment and disappointment often breeds trouble. Clothing is on the must list. Add that to your total and $180.22 is accounted for.

But you're not finished. Look at the item called *advancement*. You have $4.16. We can wrap this item up in just a few sentences. It is to take care of newspapers, magazines, etc. The morning and evening edition of your local paper will take care of at least $3.00. Add a few copies of *Life* and a few of the *Post* and it is all gone. You may have to limit your reading to your base paper and catch the rest of the news over the radio (if you have a radio). Your total committed is now $184.38.

Grooming the Groom

Go on to *health and personal care*. Your hospitalization is assured and *Medicare* for the wife certainly relieves you of a big share of what could be a heavy burden! But look at a host of other things. The package contains what is usually found under the word "miscellaneous." To nail down a few items, it includes the barber and the beauty shop. Maybe your wife can put up her own hair with a *Toni,* but you still have to buy the *Toni*. You will need tooth-brushes, toothpaste, soap, shampoo, and a line up of cremes to keep your wife's hands nice and smooth and soft (after she soaks them in dish water), and the rouge, lipstick, etc., for her makeup. You will need your own supply of *Vitalis,* razor blades, shaving cream (for men it's "cream" and for women it's "creme") and after-shave lotion. You won't have to replenish this every month. Be glad you don't. If you did you wouldn't be able to make it on $12.48. Each of you make a couple of trips to the appropriate shop (if you go to a shoppe, it will cost you more) and you will have the answer. Your total now stands at $196.86.

The next item is *recreation*. Here you have the big chunk of $4.16. You don't want to spend all your time in the house. You will want to go out once in a while—but where on $4.16? Fortunately, the price of the base theater is 25 cents. The two of you can go to a show six times ($3.00), buy six bags of popcorn (60 cents) and have 56 cents left to squander elsewhere. No matter how you figure it, there is very little other outside recreation for you in this budget. Better learn to enjoy each others company at home. If you say that you will stay home and watch television, where has a television been crowded into this budget? Now a total of $201.02 is gone. The difference between that and your total is that which was saved in your taxes—remember?

As you look over what has been written, you will say, "Hey, haven't you forgotten something—a car?" No, it wasn't forgotten. It had to be left out. Where are you going to get your car payments, car upkeep and insurance out of the $208.00? Which one will you rob? But you will have to find some way to get to work. Riding a bus or riding with someone else will be inconvenient—but you will have to become accustomed to some inconveniences if you want to marry on $208.00 a month. You already will have to cut somewhere to find money for bus fare. And should we mention a few other discouraging facts? On that budget where will you find anything for vacations, cigarettes, TV set, radio, record player, or fishing tackle? And what if you are transferred to some other spot in the U. S.? Sounds discouraging? Frankly, it is!

Undoubtedly you have been waiting patiently to get in your "lick." You will say, "My wife is going to work." That sounds good. First, she must have a job. If she works, her clothing and personal appearance expenses will jump, so say nothing of lunch money, transportation, withholding tax, and social security. It takes a pretty good job before you add very much to your original income. Whether or not a wife should work is beyond the scope of this article. But remember, there are such things as "babies." When one comes, there is not only loss of the wife's income, but a big jump in additional expense. And when a baby comes, instead of bringing joy into the family, it can make the parents miserable because they cannot provide for themselves or the baby as they thought they should.

Well, there's the picture. Looks pretty dark, doesn't it? It is. Two can't live as cheaply as one unless one doesn't eat. You can't live an automobile life on a bicycle income. You can't live on love in spite of what the story books say. Love doesn't transform hamburger into steak, a one-room apartment into a five-room furnished home with picket fence, or a six-dollar dress into a *Christian Dior* creation. It is on the rock of finances that many marriage ships have been beaten until they broke up and sank. So you want to "get married?" Maybe on second and more sober thought you should not think of marriage until you can afford it.

perils & plights of pilots

Unless you're in outer space, you can't get around the old saying that what goes up must come down. The big question is: How?

WHEN you step on a banana peel or an icy spot on the sidewalk then crash ingloriously to a one-point landing, chances are good that your first reaction is to look around for an audience, hoping there is none. After that you check for possible injuries.

No one likes to make a bad landing. Airmen in particular dislike them intensely. But the history of man's successful and unsuccessful attempts to fly like the birds is filled with crash landings and jackrabbit touchdowns . . . and reasons and excuses for them.

One of the earliest recorded crash landings was made in the 11th Century by a Benedictine monk named Elmirus. Elmirus made a set of feathered wings, climbed to the top of Malmesbury Abbey, and made a spectacular takeoff, then crashed ingloriously into a chicken yard below, breaking an arm.

"The flight would have been successful," he told his associates, "had I not needed so many feathers. Because I needed so many I was forced to use some from barnyard fowls. They had a natural affinity for the chicken yard, and thus were attracted downward. Had I been able to obtain feathers from eagles my flight would have been successful, for they would have carried me to the upper air from whence they came."

Some nine centuries later, in 1920, a strip of green grass was blamed when a pilot made a nose-first landing in a Curtiss *Jenny* training plane at an airfield operated by the U. S. Army Air Service.

Jenny's Pratt-fall

The pilot, a captain, confident that his descending plane would clear a hangar roof with several feet of altitude to spare, suddenly lost altitude and got the *Jenny's* landing gear tangled in some radio wires on the roof The *Jenny* fell to the ground in a nose-first position. Two explanations were given for the incident. Fliers who saw the aeronautical pratt-fall from the ground said the captain had apparently tried to stretch his glide, lost flying speed, and "mushed" into the radio wires. The pilot argued that a downdraft, caused by a strip of green grass near the hangar, had pulled the airplane into the wires. In order to prevent future occurrences of this nature the pilot was given a paint brush and a supply of paint and told to "Get out there and paint that grass white before we lose another plane!"

In the 1930s a lieutenant and a private, flying in a PB-2A, experienced engine trouble over some rather rough terrain. The pilot decided to stay with the plane since there was an outside chance that he could land it safely and save the Government the expense of replacing it. He adjusted the stabilizer, throttled the power back, and ordered his passenger, who had never flown before, to bail out.

The private went over the side and fell like a rock for about 2,000 feet,

then got his 'chute open about 100 feet from the ground. He landed hard. When asked why he waited so long to pull the ripcord he had a ready answer:

"The supply sergeant warned me not to lose my new gloves so I put them on before I jumped. I had a hard time finding the ripcord with them on, and the way I was tumbling downward I was afraid I'd lose them if I took them off. But I did all right. Look . . . I still have the gloves!"

Sometimes airmen come to grief through no fault of their own, make unusual landings, and walk away without need for self-manufactured excuses. In 1920 Lt. H. G. Crocker, flying a small plane near Delores Mines, Tex., experienced a ruptured powerplant and successfully glided into the only field within reach. The plane touched down, rolled to the end of the short field, and flipped over on its back, leaving his passenger, Lt. Bruce Cleveland, hanging head downward from the rear cockpit over a gully 20-feet deep. The fliers managed to extricate themselves without serious injury. Although the airplane had to be dismantled, crated, and shipped overland to Dallas for repairs, Crocker felt no embarrassment about his landing. He had done a superb job of getting himself and his passenger down safely and he felt no need for apologies to anyone.

A short time later another pilot, Lt. D. R. Harris, made a rough landing under difficult conditions. Although Harris was able to look any aviator in the eye after the landing, his passenger was somewhat redfaced when he next met his barracks buddies.

Everything had been going fine during the flight until the passenger accidently opened his parachute while strapped in his rear cockpit seat. The blossoming 'chute became entangled in the tail surfaces of the airplane It wasn't easy, but pilot Harris managed to keep the plane under control.

The passenger couldn't cut himself loose from the parachute because it was probable that it would then become more entangled in the tail surfaces. He couldn't unfasten his safety belt and go over the side because he might find himself dangling from the tail of the plane, a position that would make landing rather a nuisance for both pilot and passenger. All he could do was hope for the best. Only the flying skill of Lieutenant Harris, who descended under power, fighting the drag of the 'chute and restricted use of elevator and rudder, to land safely, saved the lives of the two airmen.

Stick Trick

Sometimes a great deal of embarrassment can result from a perfect three-point landing. In mid-1927 at Chanute Field, Ill., a flying instructor suffered that kind of embarrassment.

The instructor was considered one of the best at the Illinois air base. Cadet James Whalen, an excellent student in all phases of his training save one, couldn't be talked into landing an airplane.

One morning the instructor told a mechanic to loosen all the screws holding the control stick in the front cockpit of the training plane. He explained that he would take the stick out of its socket and throw it overboard when he got Whalen into the air and the student would have no choice but to land the plane. Word of the impending event spread throughout the hangar and eventually reached Cadet Whalen.

Whalen had already talked himself out of his fears and had made up his mind to go through with a landing on his next flight, scheduled that morning. Information that his instructor was going to throw his own control stick overboard didn't shake the cadet's new-found self-confidence.

Just before takeoff Whalen slipped a spare control stick inside his flying suit and climbed into the rear cockpit. His instructor got into the front cockpit and soon the pair were flying high above the cornfields near Rantoul and Chanute Field. After a few perfectly executed aerial maneuvers by Whalen the instructor motioned for his student to land. Whalen feigned terror.

Now was the time. The instructor removed his control stick from its socket, twirled it over his head a few times, and threw it overboard. He looked back at Whalen and was horrified to see Whalen also tossing a control stick over the side.

Suddenly the airplane went into a series of violent maneuvers. It did wing-overs, rolls, and loops. It climbed straight up, stalled out, and began to spin sickeningly. It recovered from the spin and went into a shallow climb. At this point the instructor and the cadet climbed out of their cockpits. The instructor, seeing that Whalen was getting out without difficulty, jumped. As soon as the instructor was clear of the plane, Whalen climbed back inside the cockpit, took control of the airplane, and watched his instructor's parachute come down in a muddy cornfield. Then he returned to the field and made a perfect three-point landing.

Fly Formation or Flunk

Another flying instructor, this one assigned to the advanced flying school at Kelly Field, Tex., became unhappy with seven students who failed to follow his maneuvers properly during formation flights. He ended a 10-minute lecture with these words.

"If you guys expect to become pursuit pilots, you'd better start following me properly. I want it understood that on the next flight you will have to stay with me, no matter what happens. Is that clearly understood?"

Apparently it was, for on the next formation flight the engine on the instructor's plane failed and he was forced to glide to a hazardous landing in a rough field . . . accompanied by seven student pilots who, despite his attempts to wave them off, stayed with him wing-to-wing all the way down. —HAROLD L. CRAVEN

The Sun Never Sets

by M/Sgt. Ed Blair
Airman Staff

THE rice crop had been harvested in Formosa and it was time to plow under the stubble for composting. Venerable Lin Yee Chai stood watching his 10-year-old grandson as the youngster shouted encouragement to a plodding bullock. Manfully, the boy wrestled a heavy, clumsy, wooden plow across the rice field in ragged furrows that left stubbled, golden brown islands in the rich, black earth. Lin turned to the boy's father who was frowning impatiently at his offspring's efforts.

"Only by practice can your son learn to make his furrows straight and turn under all the stubble to rot so that next year's rice will grow," cautioned Lin. "And remember, the bullock needs exercise or he will grow too fat and lazy for spring plowing."

The eldest son's answer was drowned in the throbbing roar of four 3,800-horsepower engines as a USAF C-124 *Globemaster* lifted its bulky 92 tons off the runway a half mile distant. The legend lettered along the side of the huge plane proclaimed it part of the Military Air Transport Service. In its cavernous interior—big enough for a tank or a jet fighter—it carried one-fortieth of the 800 tons of cargo airlifted by MATS that day to some distant part of the globe.

At about the same time the C-124 nosed across the Formosan coastline, another *Globemaster* wearing the MATS emblem opened its elevator doors a few hundred feet above the world's most isolated scientific outpost—the IGY station at the geographic South Pole. From the opened doors, black barrels of fuel, boxes of food, and crates of spare machine parts floated down to the hard-packed snow under brightly colored parachute canopies.

Still another C-124 taxied through the day-long twilight at Thule AB, Greenland, with a 10-ton load of jet engines, mail, and other items in short supply at that Arctic base. At Portuguese-owned Lajes Field in the Azores a jet-prop Douglas C-133 *Cargomaster*, the world's biggest and fastest military transport plane, thirstily drank 85,000 pounds of jet fuel while its crew breakfasted. From another MATS plane at the edge of the Libyan desert airmen unloaded a *Matador* missile for a practice firing and in England another group unloaded an IRBM *Thor*. In Karachi, Pakistan, a Navy flight attendant, wearing civilian clothes while crewing an Air Force plane, collected his passengers' passports from a Pakistan immigration official. In front of the MATS terminal at Rhein-Main AB, Germany, a little girl stumbled sleepily out of a C-118 into her waiting father's arms.

All these planes and crews were practicing what the old Chinese man preached. They are part of a global airlift system that has been flexing its peacetime muscles for 10 years in readiness for its wartime mission. For MATS is a military force-in-being with a combat mission as essential as that of our striking forces—Strategic and Tactical Air Commands. The fast, flexible airlift support by MATS is an integral part of their combat readiness. Daily these unarmed transports fly their global air routes, utilizing bases and service facilities—training, training, training for support of combat forces.

Other combat commands with a primary mission of destruction must necessarily simulate their end product in peacetime. But MATS training flights produce a very valuable by-product—airlift capability. Just as the Chinese boy practiced handling his bullock and plow, MATS traffic people manifest and process real people and cargo; aircrews fly operational missions; and mechanics practice their skills on operational aircraft. The airlift generated in training moves men and material all over the globe for the Department of Defense and other government agencies.

McGuire AFB, New Jersey, is a MATS base and an Aerial Port of Embarkation. Just inside the terminal entrance, in a small office marked "AF ATCO," sits a soldierly slim, graying lieutenant colonel who spends a lot of time on the telephone speaking in a drill-field voice. Usually he is reassuring some skeptic at the other end of the line.

"No, there is absolutely no need for you to report in a day early—in fact, we don't want you to. You just be here with your bags by 0930 in the morning. Your flight leaves at 1430.

"I'm the Air Traffic Coordinating Officer," Col. E. V. Brindley Jr. explains. "I'm not even assigned to MATS, I work for Air Materiel Command—been a transportation officer for years now. You might call me the travel agent. I make arrangements with MATS for all Air Force traffic through McGuire. The Army and Navy ATCOs next door do the same for their services. MATS schedules so many training flights each quarter and they tell us how much space they will have available. Individual commands and services tell us what their programmed airlift requirements will be. Each service gets its share of the space and we ATCOs see that it is all used properly—we pay for it you know."

Part of *Thor* weapon system support—a MATS C-133 turboprop.

The colonel referred to the Air Force industrial funding system that became effective in MATS last July. Industrial funds are created by the Department of Defense to finance particular operations that service two or more elements of the Government. An initial appropriation is made to provide operating expenses. Bills are rendered for services performed and the agency receiving the service transfers funds from its own budget back into the industrial revolving fund. MATS operates on a strict nonprofit basis and all military and commercial airlift costs are carefully computed so that it recoups only what it spends to accomplish the airlift. Because it comes out of their own budget, using agencies think twice before they decide on air shipment.

"When people arrive here they have a reservation by name. I'm all for this system," Colonel Brindley continued. "We have a uniform daily flow of overseas replacements through here without surges or backlogs. We've processed up to 13,000 AF-sponsored personnel a month. Their delay time averages about six-tenths of one day if the travelers have listened and followed the instructions in their orders. They arrive before noon during daylight hours and we get them out that same afternoon or evening.

"Incidentally, about 40 percent of our people are moved on a commercial contract basis. MATS has helped us to eliminate the old Personnel Processing Centers and all their horrors. I once spent 17 days in one and I know what they were like. Processing here takes about 10 minutes. We stamp your orders—that takes care of duty status, pay, per diem, and travel-pay. You fill out an emergency data card, pick up passports, and clear customs if necessary; verify immunizations; check your bags; and pick up your boarding pass and lunch receipt. That's all there is to it."

Cooperation Not Competition

The Secretary of the Air Force is the Single Manager for all Department of Defense airlift services. MATS, as the operating agency, owns and operates the airplanes; the ATCOs book the travelers. Wherever MATS traffic originates there is an ATCO representing each branch of the Armed Forces who decides *who and what goes when.* Large APOEs like McGuire usually have senior transportation officers to head ATCO sections. Sometimes there is a joint ATCO unit such as the one at Rhein-Main AB, Germany. Army Col. Robert K. Blair, aided by a three-service staff, handles all traffic through this gateway to Europe. Colonel Blair also operates the Army-owned hotel that absorbs the ebb and flow of the traffic there because the reservation system is not in full effect yet.

Mrs. Laura Speight was pleasantly surprised at how fast and simple it was to join her husband in England when she traveled via MATS last October. She had been overseas twice before, both times to Japan. She spent two weeks aboard ship the first time over after traveling from the ancestral home in North Carolina to California by train. Her second trip took 17 days aboard ship again after the cross-country trip from the East coast. In October after the Air Force began moving all its personnel—both military and their dependents—overseas by air, Mrs. Speight and her two sons made the entire trip from North Carolina to England in only three days.

Military and dependent passengers aboard MATS-contracted commercial flights exercise the traffic system, save man-hours, preclude competition.

MATS' DCS/Operations, Brig. Gen. G. R. Birchard, knows exact position and status of every transport aircraft, traffic in the system, and how each mission progresses.

"This is the way to travel," she confided to a new acquaintance aboard the comfortable C-118 that whisked them across the Atlantic overnight. "We had a good night's sleep last night in the special hotel. It was cheap, comfortable, and convenient. We had a good breakfast in the cafeteria right next door. We aren't at all tired and the boys have missed very little school. That's important you know."

Whenever anyone mentions MATS to Mrs. Speight hereafter she will very likely remember it as a comfortable way to go overseas "just like a civilian airline." Therein lies one of MATS' biggest problems. Unfortunately, too many people, both military and civilian, see the command as a military organization competing with civilian airlines for Department of Defense and other governmental traffic. Last summer a special subcommittee for the House of Representatives Committee on the Armed Services called a hearing to discuss this alleged competition. The subcommittee chairman, the Honorable L. Mendel Rivers summed up the findings:

"We have found out a lot about MATS we didn't know . . . but I think we are of one accord that it is an indispensable and integral part of our overall military striking force."

Actually MATS is in sort of a partnership with civil airlines. Eighty million dollars of this fiscal year's MATS budget was made available for the purchase of overseas commercial airlift. Approximately $47 million of this has been obligated to 12 commercial airlines, both large and small, in year-long contracts to move cargo and DOD personnel overseas. In addition, MATS has "call" agreements with 28 overseas airlines for short-term contracts to augment MATS operations. Within the United States, where MATS schedules only air evacuation flights between service hospitals, nearly a million dollars more has been committed for the commercial airlift of missile test components and research personnel from factories to Patrick AFB, Fla. Another $19.5 million has been obligated to four commercial carriers for airlift of high priority, high value supplies and equipment to stateside bases and aerial ports. The total bill to be paid to civil carriers this year has been estimated to be roughly $300 million.

MATS transports are the logistic link between these aerial ports and our strategically located overseas bases from which SAC and TAC can strike quickly at any enemy. In this jet-atomic-missile age, technology can change weapon systems and tactics almost overnight, so stockpiling costly supplies and equipment is neither economical nor practical.

Air Materiel Command which is responsible for all these supplies and equipment is one of MATS' biggest customers. MATS is an air bridge from the factory to the flightline. AMC is phasing down its huge supply depots overseas because they have found that they can save money, manpower, and space by reducing their overseas inventories. Instead of a hundred items gathering dust on warehouse shelves they stock a dozen or less. When one is issued they reorder immediately for aerial delivery via MATS. All aircraft engines are now being supplied direct from the states by air.

AMC's huge depot at Chateauroux, France, will soon be little more than a service unit although it supports well over a hundred using agencies in Europe. Instead of stockpiling equipment there for trans-shipment to the users, MATS flights regularly deliver AMC cargo to England, France, and Germany. The same thing is happening to other AMC depots all over the world. MATS traffic people offload cargo directly into trucks for units located within a 400-mile radius. If it is destined for bases farther away, or if it will be slowed by national boundaries and customs inspections, it is airlifted by theater aircraft. Although MATS restricts its operations to transocean theater resupply, it keeps a squadron of C-124 troop carrier aircraft on TDY in Europe and another in Japan to augment theater airlift.

The bigger, faster, C-133 *Cargomasters* are biting a bigger chunk out of this overseas cargo, buying still more time which MATS' vice commander, Maj. Gen. Frederic E. Glantzberg, describes as "a rare and precious commodity."

MATS also expects early delivery of three C-137s, the military transport version of the Boeing 707 *Jet Liner,* but it will be a long time before their transport fleet is fully modernized. Jets can do the job cheaper. Last year the command produced 82,600,000 ton-miles of airlift with 516 aircraft and 28,230 men at a cost of $28,833,000 with a capital investment of $843 million. MATS planners estimate that an investment of $390 million in only 82 jet transports would enable them to do the same job with only 17,000 people. Needless to say, the airlift available for support of other combat commands would be vastly improved. Meanwhile they get the job done.

Gears Shift Themselves

Mrs. Speight and her fellow passengers would have been disappointed and perhaps a little irked had strategic or tactical military operations forced them to travel by surface transportation. However, they might have understood the real mission of MATS better. But it is very unlikely that any of MATS' customers will ever be turned away, because the command is inherently a flexible organization with the peacetime training schedule based on flying each of its 500 transports an average of only five or six hours a day. MATS' commander, Lt. Gen. William H. Tunner, who bossed transport operations during the famous Berlin Airlift has a very simple analogy that describes MATS' flexibility.

"Our peacetime training is aimed at stepping up our tempo to meet any emergency. You might say that we have an automatic transmission. Instead of having to shift gears and manipulate the clutch when an emergency arises, we simply press a little harder on the throttle—and the gears shift themselves, smoothly."

Thus about 200 (40 percent) MATS aircraft are in the air all the time moving DOD personnel, jet engines, spare parts, missiles, weapons, ammunition, supplies, and equipment to overseas bases. The remaining 60 percent are on the ground at their home stations, ready.

How ready was demonstrated vividly when the latest crisis developed in Lebanon. Thirty-six C-124 *Globemasters* were quietly on their way to Europe before President Eisenhower announced publicly what action the United States would take. MATS was expected to have the airlift Task Force in place at Rhein-Main AB, Germany, within 36 hours after it was alerted. Germany is 30 hours flying time from the U. S. for a C-124 troop-carrier aircraft. *The first plane was in place within five hours.* Aircraft in the system in England, France, and the Azores were diverted. By the time the last plane was in place, 34 hours after the alert went out, the first one had landed in the Middle East.

"When the security of the Free World is suddenly threatened, we simply cannot wait for the acquisition, modification, and mobilization of commercial airlift for these most urgent actions," General Tunner declared. "Nor can industry be expected to participate with the military in these immediate initial steps which, for the safety and security of the Nation, cannot be publicly divulged. Time and surprise are two essential ingredients of military success; we cannot afford to compromise either."

Through a worldwide communications net operated by Airways and Air Communications Service, a MATS subcommand and third oldest command in the Air Force (see May 1958 AIRMAN), the exact whereabouts of every MATS aircraft is known at any given time. They can be diverted and reaction time to any emergency is thus measured in minutes. From 323 strategically located stations throughout the world AACS operates its system for the entire Air Force.

When Throttle Is Pushed

While normal traffic such as the flight that took Mrs. Speight to England continued on schedule, 50 MATS aircraft flew 314 trips—7,000 hours—moving more than 5,000 tons of cargo and 5,000 troops from Europe to the troubled Middle East. Flight crews worked longer than normal training hours. Maintenance, supply, and support people went on 12-hour shifts, seven days a week. The throttle had been pushed a little harder.

MATS still had 50 aircraft committed in the Middle East when the Chinese Communists resumed shelling Quemoy, apparently in preparation for an invasion of Formosa. Again heavy transports with MATS markings

Anywhere under the sun MATS' competent mechanics live up to their code of ethics that guarantees safety.

smoothly stepped up their operational tempo. Within days they had airlifted into Formosa the high priority men, missiles, and materials that provided a composite strike force which was the most mobile, fastest, hardest-hitting air task force ever assembled. There was no confusion or last-minute planning—the plan was built right into the MATS organization. It was done by people who had practiced their profession until the "gears shifted themselves."

MATS units have certain individuals designated by name from traffic, operations, and other ground sections who form a team to handle such situations as the Formosa lift. They are intended primarily for SAC support missions. When the Formosa alert word went out it didn't take Col. Herman Rumsey, commander of the 1503rd Air Transport Wing at Tachikawa, Japan, long to alert his team. From past experience he knew how long it would take them to get into place at Kadena, Okinawa, where the lift would stage into Formosa. The support unit at Kadena was a detachment of his wing and they had only to augment the people already there.

"I'm proud of our outfit," said Colonel Rumsey. "This is an extremely complicated business we're in. We've set up routes, operations, maintenance, and processing procedures. It has taken time, effort, and experience. We have a system set up, not necessarily the best, but it's working now and we are still improving it. My chest swells a little when my support team moves into one of these hot spots, gets set up, and is ready to operate when they are needed. Then they finish the job, say 'thanks, we'll see you next time,' pack up, and come on home."

Throughout MATS such teams are ready for any support mission be it a SAC movement, a tactical operation, or just a drill. Colonel Rumsey's team in Okinawa didn't get nearly the workout they expected. A MATS Air Weather Service plane flying typhoon reconnaissance out of Guam (see May 1958 issue THE AIRMAN) found a tropical storm right across the airlift path. That didn't stop the operation. Transport Coordinating Center just diverted the route through the Philippines. The AACS unit at Clark Air Base, already short-handed because part of their people were manning mobile towers in Formosa, handled nearly 6,000 aircraft in August and over 7,000 in September.

The 1506th Support Squadron at Clark, set up to turnaround three trips a day—about 90 per month—serviced 200 during that crucial month. Although there was barely room to park the movement aircraft on the spacious ramps at Clark, and not even enough maintenance men assigned to provide one for each aircraft, there was only one delay in 104 of the special movement trips. Again the throttle had been pushed a little harder.

Of course MATS couldn't bear such a burden indefinitely if war came, but it could hold out for at least 30 days, General Tunner told the House subcommittee last summer. Besides, within 48 hours the Civil Reserve Air Fleet should be in operation. This is a group of 295 civilian-owned and operated aircraft capable of overseas operation that have been modified with special communications and navigation gear that would phase right into the MATS system if the bugle for an all-out effort should blow.

In Lebanon an AACS MATSman adjusted an antenna guy line, part of the mobile communications equipment airlifted there when trouble started.

And in the Philippines other AACS men in the control tower talked faster when the Formosan crisis and a Pacific typhoon shunted an additional 3,000 aircraft onto Clark AB runway. They still spared enough men to augment Chinese control tower operators in Formosa when MATS planes landed with men, missiles, and machines.

Combat Support, In Being

Just like Colonel Rumsey said, MATS is a complicated business—so complicated that very few of MATS' customers understand it and even a few MATSmen lose sight of the whole organization. Simply stated, "the *primary* mission of MATS is to maintain, *in being,* the military transport, troop carrier, service forces, and en route bases and air routes to meet the approved wartime requirements of the Department of Defense. . . ."

Broken down into its parts, it would take volumes to chronicle the operations of the two Transport Air Forces alone. But less than half of MATS' 120,000 people are involved directly in the transport operation. Fifty-five percent of the strength and 60 percent of the budget are concentrated in the "service forces." Four thousand of MATS' people—three wings—are actually in the Navy although they operate and maintain Air Force equipment. MATS was the first unified command, organized in 1948 when the old Air Transport Command and the Naval Air Transport Command merged.

AACS, the largest subcommand, maintains worldwide communications and operates STRATCOM, the long-range air-to-ground communications net that supports global air operations. AACS mans the towers and maintains navigational aids. Air Weather Service supports both the Air Force and the Army on a worldwide scale, flying about 60,000 hours a year gathering valuable weather data. Air Rescue Service operates 160 aircraft from 18 locations "that others may live." Because MATS is responsible for USAF operations in Iceland it commands the Iceland Air Defense Force, a fighter squadron whose mission is obvious.

And in the still-dawning missile age the Air Photographic and Charting Service, MATS' youngest command, is becoming ever more important. APCS not only produces standard aeronautical charts and other navigational publications, it prepares and distributes charts and maps essential to proper utilization of advanced weapon systems and missile guidance. Precise geodetic positions are necessary for effective use of ballistic missiles—APCS surveys are establishing these precise positions with the most advanced equipment available.

Unlike the Chinese boy who stopped his practice plowing when the sun set in Red China across the Formosa Straits, MATS goes on with its useful practice missions around the clock and *the sun never sets on MATS.*

No Moon Money, Man!

MATS' two troop-carrier wings based at Donaldson AFB, S. C., and Larson AFB, Wash., spend most of their time on special projects supporting all sorts of operations from the Dew line to Deep Freeze. A 53rd Troop Carrier Squadron crew was discussing the probable success of the Air Force *Thor-Able* Moon rocket in a flightline coffee shop at Burtonwood, England, when one officer said:

"I sure hope that rocket doesn't reach the Moon." The others looked at him, surprised, then someone asked, "Why?"

"Man, we'll have to support it and that's field duty with no per diem," he answered. The rest thoughtfully agreed.

The sick and wounded are precious cargo, always within 72 hours of a stateside hospital via MATS air evac flights.

they went

They call themselves aerial cowboys and their primary job is keeping several jumps ahead of the hot lead and rockets of pursuing interceptors. But unlike their western counterparts, these hombres never shoot back.

And the only rope they ever stretch is a mile-long cable at the end of which is a slipstream-rustled, 45-foot-long fabric target which trails behind their airborne bronco.

Officially, *they* are the eight airmen and six officers who make up the only organized Tow Target Flight in the Far East. The unit, commanded by Capt. Robert C. Mikesh, chalks up about 150 flying hours a month towing targets for the F-86s and F-100s based in Japan, Okinawa, Guam and the Philippines. The Tow Target Flight flies the B-57E and calls Johnson AB, Japan, its "home spread."

On missions, the aircraft travels at 360 knots at an altitude of approximately 31,000 feet. Flying in wolf pack fashion, about 35 miles from the B-57E, fighter interceptors are guided in on the target by Ground Control Intercept. In an accompanying T-33, a qualified interceptor pilot and observer give final clearance before the attack gets underway.

About 30 miles from the contact area, the tow reel operator releases the target. When the interceptors make radar contact and the T-33 crew gives the okay, the fighters automatically fire their rockets.

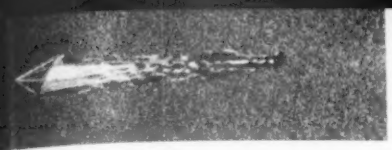
"The only time the fighters see the target is after they've made their pass," explains Captain Mikesh. "They can tell then whether a hit was made."

As the mission ends, the tow reel operator reels in the battered target to within 15 feet of the aircraft, and cuts it off.

Then Ramrod Mikesh puts the spurs to Old Nell, gives her her head, and ponders over what the boys in the chuck-house will be slingin' tonight.

Tow reel operator George MacFeggan helps pack the target.

Tow reel is loaded into bomb bay of the B-57E before the target is adjusted.



t that-a-way

by S/Sgt. Leroy S. Ray
Hq, 5th Air Force

Photos by M/Sgt. Norman Zeisloft and T/Sgt. O. A. Gracia, Hq, 5th Air Force

"Stirrup" to steed with a slight assist.

Two-man Crew—pilot and tow reel operator —gets parachutes adjusted before takeoff.

Captain Mikesh (right) commander of the tow target flight, discusses the mission with tow reel operator, A/1C Ronald Cutting.

Ground crew loads the rolled-up canvas target in cannister compartment of the B-57E.

by T/Sgt. Jim Stockwell
Hq, Air Training Command

Calling all Marksmen

IN A converted dining hall at Lackland AFB, near San Antonio, Texas, the Air Force is taking the first big step toward reinstating small arms proficiency among personnel.

The new USAF Marksmanship Center was created a year ago for two reasons: competency with firearms has traditionally been considered one of the military profession's primary skills, and we learned the hard way in Korea that lives of aircrew members downed in enemy territory may depend upon their proficiency with assigned firearms. (See: "The Air Force is Learning to Shoot," Nov. '57.)

The Center was officially activated January 20, 1958. For the next nine months, assigned personnel worked on the course of study and training methods. During this time the teaching staff swapped know-how: rifle shooters studied pistol marksmanship while the handgunners improved their rifle proficiency.

The first students were Lackland Air Force Base tactical instructors who, in turn, taught experimental classes of basic trainees. In this way the Center's faculty was able to evaluate the training methods and develop a workable program.

Last November the first actual class entered training. Since then a new class of 30 students has entered the program each month. Chosen for their interest and proficiency, the trainees receive a 12-week course leading to a marksmanship instructor AFSC (75330). Every graduate then returns to his home base to develop a small arms program and organize a Rod and Gun Club. The latter stimulates and maintains interest in marksmanship.

To adequately prepare the small arms instructor corps for their responsibilities, the Air Force staffed the Center with some of its crack rifle and pistol shots. Col. Thomas C. Kelly, director of the Marksmanship Center, won the Twining Pistol Trophy in 1955 and again in 1956. Several show cases filled with trophies and awards captured in national competition attest to the faculty's shooting skill.

In February 1958 the Center's pistol team entered its initial meet—the annual Texas Midwinter Pistol Tournament—and walked off with first place by defeating the 1957 championship Army team from Fort Benning, Ga.

Last May, T/Sgt. William H. Mellon, an instructor at the Center, became the first member of the Air Force to score 2600 points in pistol competition. Shortly thereafter, T/Sgt. John L. Keyser, another winner of the Twining Trophy for two successive years, equalled Mellon's score and in January of this year T/Sgt. Fred E. McFarland of the Center's staff scored 2600 points —a feat equivalent in shooting to the track man's four-minute mile. All three airmen are now members of the "2600 Club," an exclusive sharpshooting fraternity, whose membership roster lists only 49 members throughout the U. S.

Capt. Dick Hanson, OIC of the Center's rifle phase training, copped the coveted Wimbledon Cup Rifle Award for 1951. Firing in a highly

competitive Swiss match in 1954, he hit 256 consecutive bull's-eyes to set a record which still stands.

The three-part training program taught by these professional marksmen is a thorough one. It includes: Phase One—instructor training, the marksmanship career field, organization of Rod and Gun Clubs, records maintenance, equipment procurement, customs and courtesies at firing matches, and operation of reloading equipment.

Training in pistol marksmanship, during Phase Two, includes range construction, operation, firing and measuring.

Phase Three covers rifle marksmanship, range construction and operation, mechanical training on rifles, spotting and rifle scopes, range firing and measuring.

In support of these courses, a small bore range and a pistol range were recently constructed on the base. The Marksmanship Center also boasts a completely equipped gunsmith shop, a drafting room where scoring charts and training aides are designed, and a fully equipped administrative and supply organization. Support activities are handled by ATC's 3700th Technical Training Squadron.

Camp Bullis, a nearby Army installation, provides ranges for high-power rifle practice and competition that requires longer ranges.

The Center will annually conduct the USAF Worldwide rifle and pistol matches, equip and coach two rifle and two pistol teams for interservice competition, and conduct various other marksmanship projects. Last month, for example, it was the scene of the First Annual Inter-Service Pistol Championships.

Enthusiasm for shooting and competition is evident both in the atmosphere around the classrooms and on the firing ranges at the USAF Marksmanship Center. Upon entering training, the instructors tell new students:

"We're going to teach you to teach the Air Force to shoot." And they mean *to shoot straight.*

Air Force personnel interested in assignment to the Marksmanship Instructor Course should apply through normal channels to Headquarters, Air Training Command.

Tops in 1958 pistol competition, members of the Air Force Blue team look over new 38 cal. pistol and target used to test it. From left: Col. Thomas C. Kelly, center commander, and T/Sgts. William H. Mellon, John L. Keyser, and Fred E. McFarland, pistol instructors at the Center and members of the exclusive "2600 Club."

Lt. Gen. Floyd E. Parks (U. S. Army Retired), Executive Director of the National Rifle Association, presents the coveted Vandenberg Cup to Capt. Morton C. Mumma, high scorer in the President's Cup Match during the national rifle and pistol matches held at Camp Perry, Ohio.

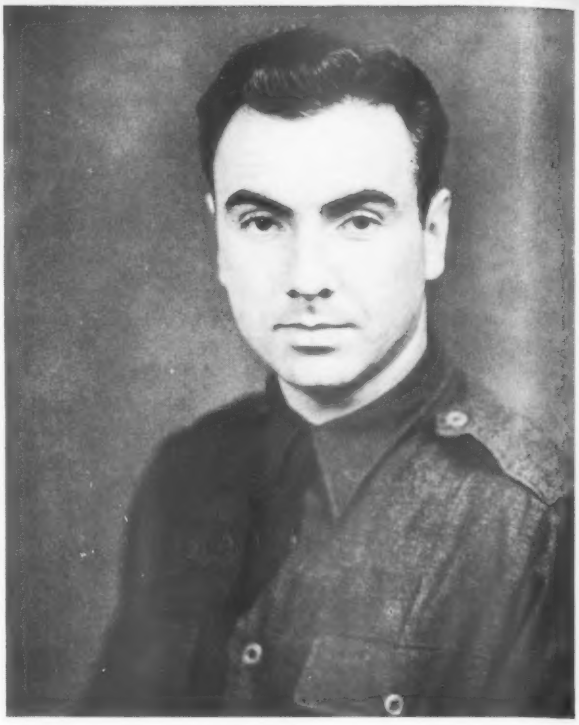
In the Name of Congress

NO. 6 IN A SERIES

Checked in the central and northern Pacific, the Japanese continued to bite off gains in their southward thrust. Limited air forces and determined crews were the main buffer between the enemy and Australia.

VOLUNTEER MISSION

by M/Sgt. Hal Bamford



Capt. Harl Pease, Jr.

AFTER the Japanese attack on our Hawaiian installations, one of the first aims of the Allied forces was selection of a line beyond which the Japanese must not pass.

Allied planners chose strategic bases as the anchor points for a great semi-circle which ran from Alaska on the northeastern extremity through Hawaii and Australia to India-Burma on the west. The build-up of forces to secure that line began early in 1942.

Almost without exception, the outward flowing tide of Japanese forces was checked along the northern, eastern, and central perimeters. In the south, however, the enemy continued to inch forward. Australian security was endangered.

Late in July, Japanese forces landed on the northern Papaun coast of New Guinea, near Buna. Their immediate goal was to drive across the Owen Stanley Range capture Port Moresby on the south coast, and bring Australia within range of their bombers. The Allied air, ground, and sea forces opposing this move could only be described as "pitiably inadequate."

Allied Air Forces, under the command of Lt. Gen. George H. Brett, were woefully undermanned. On paper, they consisted of five bombardment and three fighter groups, and one photo and two transport squadrons. The five bombardment groups included two heavy, two medium, and one light; however, only the 19th Bombardment Group, of the heavies, was fully combat-equipped, and the majority of the load would necessarily rest on the personnel of this unit, a role which was becoming rather routine for the organization.

Although the war was only months old, the 19th had earned a reputation for its exploits which was far-reaching. It had been planes of the 19th which blazed the first air route across the South Pacific prior to the outbreak of hostilities; Colin Kelly's famed mission had been as a member of the group; and it was men and planes of the 19th which had evacuated General MacArthur and his staff.

The famed 19th was based in Australia near Townsville on the northeast coast nearly 700 air miles from New Guinea. In order to mount an aerial offensive of any proportion against the enemy, it became necessary to utilize Port Moresby as a staging base. At the same time, this brought our meager aircraft supply within easy range of the Japanese, so only refueling and arming was done on New Guinea.

Missions flown in this manner kept the Boeing B-17 *Flying Fortresses* away from their home station as long as 36 to 48 hours, at least 18 of which were normally spent in flight. The resultant strain on crew members and aircraft was tremendous.

During the Japanese advance in New Guinea, the air bases at Rabaul, New Britain, proved to be the jumping-off place for launching their aerial and supply operations. Warehouses in the area contained a six-month supply stock for both the Southeastern Fleet and the Eighth Japanese Army Area. Docking facilities included seven wharves, extensive repair facilities, virtually unlimited small boat harborage, and submarine fueling and handling accommodations. In short, Rabaul was the keystone of the Japanese advance in the Bismarck Archipelago and was protected accordingly. More than 400 land-based anti-aircraft defenses supplemented approximately 200 bombers and 300 fighters based at the five airfields ringing the

area. In addition, units of the Japanese Navy were constantly shuttling in and out of the port and adding strength to the land defenses.

Thus it was inevitable that Rabaul became a prime target for an air counter-offensive. Early in August, the 19th Group, which did herculean duty during the early stages of the air war, doubled its daily operations out of Port Moresby, increasing the number of missions from two to four each day.

On August 4, 1942, Maj. Gen. George C. Kenney assumed command of the Allied Air Forces. Among his first duties was the execution of plans for coordinated operations between his long-range bombers and the American forces scheduled to land at Guadalcanal. Only hours after he had assumed command he ordered a major attack against Rabaul. The idea was to hit the Jap heavy bombers on the ground to keep them from molesting the landing operations in the Solomons.

On August 6, part of the 20 aircraft scheduled to operate out of Port Moresby on the major long-range assault the next day, were assigned to hit Horn Island in order to assure the normal daily routine so as not to alert the Japanese forces to the fact a major move might be afoot. Among these aircraft was one piloted by Capt. Harl Pease, Jr. About 50 miles out from Port Moresby, one of the engines of his B-17 swallowed a valve and he was forced to abort.

Knowing that engine replacement could not be accomplished in New Guinea, Pease and his crew coaxed the crippled plane to Townsville. Well aware that the major strike scheduled for the morrow would demand every plane and crew that could be mustered, Pease and his men volunteered to return to the advanced base and join their squadron for the mission.

Aircraft, however, were scarce, but Captain Pease finally convinced personnel at the home base of the sincerity of himself and his crew and the feasibility of the drastic move and was assigned a B-17 which had been declared "combat weary," unserviceable for such a mission. Old number 416 was minus a lower turret and had been doing duty as a trainer.

While ground crews pitched in to check the ship over and fuel it, the volunteer crew remained close at hand. The job completed, they hopped off for the return flight to Port Moresby. Less than three hours after they had landed, they were ready to take off again, this time for the important Rabaul strike.

Actually, it was not as simple as that. The added range of the proposed strike against Vunekenau air base necessitated the addition of a bomb bay tank. The electric fuel-transfer pump had been removed from the borrowed ship, and Pease and his crew had to borrow a hand-operated pump from one of the other planes, scrounge a length of hose, and manufacture make-shift connections to prepare their aircraft.

Twenty planes were scheduled for the strike, a huge operation for that stage of the war. Led by Lt. Col. (now Maj. Gen.) Richard Carmichael, 19 aircraft departed Port Moresby. One crashed on take-off; six others turned back because of various difficulties; 13 reached the target.

The citation noting Pease's action was published in November, 1942, and describes, most eloquently, the heroism of the mission which earned the gallant captain the Medal of Honor.

For conspicuous gallantry and intrepidity above and beyond the call of duty in action with the enemy on 6-7 August 1942. When one engine of the bombardment aircraft of which he was pilot failed during a bombing mission over New Guinea, Captain Pease was forced to return to a base in Australia. Knowing that all available airplanes of his group were to participate the next day in an attack on an enemy-held airdrome near Rabaul, New Britain, although he was not scheduled to take part in this mission, Captain Pease selected the most serviceable airplane at this base and prepared it for combat, knowing that it had been found and declared unserviceable for combat missions. With the members of his combat crew, who volunteered to accompany him, he rejoined his squadron at Port Moresby, New Guinea, at 1 a.m. on 7 August, after having flown almost continuously since the preceding morning. With only three hours rest, he took off with his squadron for the attack. Throughout the long flight to Rabaul, New Britain, he managed by skillful flying of his unserviceable airplane to maintain his position in the group. When the formation was intercepted by about 30 enemy fighter planes before reaching the target, Captain Pease, on the wing which bore the brunt of the hostile attack, by gallant action and the accurate shooting of his crew, succeeded in destroying several Zeros *before dropping his bombs on the hostile base as planned, this in spite of continuous enemy attacks. The fight with the enemy pursuits lasted 25 minutes until the group dived into cloud cover. After leaving the target, Captain Pease's aircraft fell behind the balance of the group due to unknown difficulties as a result of the combat, and was unable to reach this cover before the enemy pursuit succeeded in igniting one of his bomb-bay tanks. He was seen to drop the flaming tank. It is believed that Captain Pease's airplane and crew were subsequently shot down in flames, as they did not return to their base. In voluntarily performing this mission Captain Pease contributed materially to the success of the group, and displayed high devotion to duty, valor, and complete contempt for personal danger. His undaunted bravery has been a great inspiration to the officers and men of his unit.*

Only Pease's *Fortress* failed to return.

Both the mission to Rabaul and the Solomon's invasion were crowned with success. Although the Japanese ground forces on New Guinea continued to advance until, by September, they were within 30 miles of Port Moresby, the southward thrust of the aggressive forces was blunted. Marine capture of the airstrip on Guadalcanal provided a new northern base from which to strike.

Allied air strength, broken and nearly wiped out only eight months previously, now began to gain the upper hand in the Pacific. The stage was set for Allied Forces to throw off their defensive cloak and begin traveling the long road back. Three years later, Gen. Douglas MacArthur would stand in triumph aboard the battleship *Missouri* in Tokyo Bay and receive the Japanese surrender.

Early in 1957, a grateful Air Force, aware of the tradition to which Capt. Harl Pease, Jr., had so gallantly contributed, renamed Portsmouth AFB, New Hampshire, in honor of this fallen hero.

SLANTS ON SPACE

/// Solar System Oddity: Neptune, eighth of the major planets in distance from the Sun, has two moons, Triton and Nereid. The former revolves around Neptune in a retrograde east to west direction, the latter from west to east.

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/// What's in a name? The *Project Mercury* designation picked for the first U. S. manned space capsule offers a good example of the strange assortment of connotations one may combine.

From the standpoint of space medicine, which the mission should serve, there is this to commend it: Mercury, according to mythology, acted as the special messenger of Apollo, the old god of healing. Apollo, so the story goes, entrusted Mercury with the wing-topped staff—better known as the caduceus—after which the medical fraternity fashioned the familiar symbol in use since the 16th century. (It was first incorporated into U. S. military insignia in 1902.)

Astronomically, ancient scientists once confused the mythological messenger with his boss by calling the planet we now know as Mercury by that name when they observed it east of the Sun at eventide and then referring to the selfsame celestial body as Apollo when they beheld it west of the Sun in the mornings. Some may consider it significant that Mercury's name is now firmly attached to the innermost planet of the solar system whereas Apollo rates no such celestial recognition at this late date.

Apropos of this, it may be well to note that besides being a top echelon messenger Mercury was also a god in his own right and the matter of good luck was one of his special provinces which made him a favorite deity with mortals addicted to taking a chance. Sculptors have represented him as a young man wearing winged sandals, a winged hat and bearing the caduceus cradled in one arm.

/// Mercury and Venus are occasionally referred to as "inferior planets." This usage, of long standing, arises from the fact that both have orbits closer to the Sun than the one the Earth follows. It does not carry the implication that the two are only second class members of the planetary system family.

/ / /

/// The celebrated "canals" of Mars owe much of the discussion about them in English to the inept translation of a single word from another language. Although certain real or fancied markings on the reddish planet had been noted and even mapped by earlier astronomers, the canal furor was really kicked off by Giovanni Virginio Schiaparelli (1835-1910), an Italian savant, who started a 13-year study of Mars in 1877. He was the first to pay special attention to such lines and during his study claimed to have identified and recorded over 100. When he wrote of them in his native language, he used the word "canali" which, properly translated, should have been rendered "channels" or, more specifically, "channels of natural origin." A study of the text of the first work in question shows he compared the phenomena recorded to "lines" and "stripes," carefully noting they were more regular than the courses of winding Italian streams.

Upon translation of this work into English, however, the key word came out as "canals." The result was that some jumped to the conclusion that only a planet populated with beings capable of engineering feats could have such a canal system and the fat was in the fire.

Modern scientists seem agreed that the "canali" are neither as numerous or as regular as once supposed. For the generally accepted markings on the planet of the war god an assortment of varying theories have since been offered, none involving the exciting spectacle of canal-building Martians. Nevertheless, experts in the study of Mars still speak of the "canal mystery" and express the hope it will be some day solved for good.

/ / /

/// As debate and speculation continue on the military advantages of versatile capability in true space, another civilian scientist specializing in the satellite field has joined the majority camp that foresees no across-the-board decisive benefits of purely military significance. He is Dr. Fred Singer of the University of Maryland's physics department.

"Many scientists have come to the conclusion," he observes, "that the real military advantages of space are not likely to be very direct in the sense that they can be used for destructive purposes or for purposes closely allied." He expressed the opinion that ultimately advantageous gains for the military are more likely to materialize in the byproducts.

/ / /

/// Some Notes on Old Sol: The mean distance (line-of-sight) between the Earth and the Sun is 93,004,000 miles. For a manmade device to approach within a million miles of solar environment intentionally or by reason of missing some closer objective, however, would involve traveling a flight path of more than twice that distance at the minimum. On the surface of the photosphere (the bright portion of the Sun visible to the unaided eye) the Sun exerts a gravtitational force 27.6 times that at sea level on our planet, which is to say that an object weighing 100 pounds on Earth would weigh almost 1½ tons on the Sun. It would take 109.1 Earths lined up side by side to match the Sun's diameter. To duplicate its volume that of our planet would have to be multiplied by 1,300,000. Solar temperature at the photosphere is in the order of 11,000 degrees F.

—W. A. KINNEY

From Down Under

Photo by A/3C Frank Barrasso

AIRMAN'S WORLD

Nearly 100 officers representing the Royal Air Force (RAF), Royal Canadian Air Force (RCAF), and Royal Australian Air Force (RAAF) are presently assigned to USAF units in the United States.

Purpose of the program is to promote active relationship between these allied services by providing first-hand association with experiences, equipment, professional knowledge, and service doctrines of the sister air arms of these friendly nations.

The determined looking gentleman shown here, about to board a Boeing B-47, is Squadron Leader Keith R. Bartlett of the RAAF who is presently assigned as an aircraft commander instructor at McConnell AFB, Kans.

Ten Australian officers are presently serving tours with USAF, and approximately four times that number from both the RAF and the RCAF are also actively engaged in the exchange program. Duties closely parallel those normally performed in the parent service and tours last between 18 and 24 months. Full details on the program are contained in AFR 36-41, dated 19 November 1958.

A LITTLE BIT OF ENGLAND

RAF Flight Sgt. W. T. Davey (center) aids two USAF teammates, A/3C Pedro Cortez (left) and A/3C Eduardo Kennedy, with some of the finer points of soccer.

An APO number is common enough in USAF addresses to elicit very little surprise. But there's a comparatively new address in RAF mailing lists that must come as quite a shock to USAF members who encounter it.

The unit in question is the RAF Transport Command Staging Post. Its mailing address—Travis AFB, Calif.

This little bit of England was transferred to our west coast in September, 1957 and has become an integral part of the Travis community. Comprised of 26 men, the contingent is charged with the responsibility of servicing RAF aircraft plying westward routes between the United Kingdom and its Pacific bases.

Dependent upon USAF flightline crews for a variety of services, the experiment has proven to be a huge success in Anglo-American relations. No job is too complicated to keep Air Force men from "pitching in," and this cooperation has spilled over into off-duty hours.

In December, Sergeant T. C. Davies, equipment supply man for the detachment, served as a British Santa Claus in several community celebrations. In return, many of the detachment members were invited to spend their holidays as guests of local families.

Travis' soccer team has become a great favorite with local sports fans. The fact that they are a winning unit unquestionably has helped their popularity, and a large measure of that success must be attributed to the presence of the British players who now outnumber their American cousins on the "varsity."

Most of the RAF-men have come to look upon their 12-month tour as a once-in-a-lifetime opportunity. Aside from gaining a first-hand introduction to American customs, they have accepted the chance to explore the far reaches of the west coast and make it a point to cover as much territory as their off-duty time will allow.

TWIN CAREERS

It isn't often that a man enjoys the thrill of retiring twice in a lifetime—especially if the two chosen careers are as thrill-packed as firefighting and the military. M/Sgt. Joseph P. Gerrity, Myrtle Beach, S. C., is rapidly approaching the time for such a distinction, however.

Retired from the New York City Fire Department in 1943, Sergeant Gerrity decided to return to his first love—the military, a career that had been interrupted when he was discharged from the Coast Artillery in 1922. He originally enlisted in the New York National Guard in 1915 and went on active duty when his unit was federalized in 1917.

When Gerrity returned to his Brooklyn home after World War I, he became a member of the fire department and served honorably, and in many cases heroically, for 21 years.

One of his exploits was featured in Irving Crump's book, *Our Firemen*. While climbing an aerial ladder to a 16-year-old girl, trapped on the fourth floor of a Brooklyn tenement, he heard her cry "I'm going to jump!" Gerrity wrapped his legs about the ladder rungs, and as she fell past him, grasped her by the wrist and held on until additional aid arrived.

Sergeant Gerrity's exploits since joining the USAF have been almost as dramatic. He served in England during the closing stages of World War War II; was Fire Chief at the French-controlled Tegel Airfield in Berlin during the famed Airlift; and held the same position at Kimpo AB, Japan, during the Korean conflict.

It was during this latter tour that he was awarded the Soldier's Medal for saving an F-86 *Sabrejet* pilot from death by braving the flames which enveloped the craft to free the dazed airman and carry him to safety.

SUPPLY — THE HARD WAY

Helicopter pilots of the 551st Operations Squadron, Otis AFB, Mass., recently completed their 1,000th Texas Tower Support Flight.

Marking the accomplishment as something more than extraordinary, the flight signalled the culmination of more than 3,000 accident-free hours compiled over a three-year period of support during which the Piasecki H-21 'choppers have hauled more than 2,000,000 pounds of cargo and 7,800 passengers. Coupled with their operations in other areas, this remarkable unit has avoided accidents for more than 42 months and 5,200 hours of flight.

Mission 1,000 was flown to and from Tower No. 3 and was typical of the hazardous flying which is encountered in supporting these far-at-sea early warning sites. Almost every mission requires long-range flying over the Atlantic at maximum gross weight. An SOP is virtually useless as each trip proves to be a new experience with such hazards as icing, fog, snow, rain, and strong, turbulent winds. In addition, though each of the three towers is equipped with radio beacon and communication facilities, there are still extensive periods in which the helicopter crews have no contact with either tower or land-based stations.

PROXIMITY

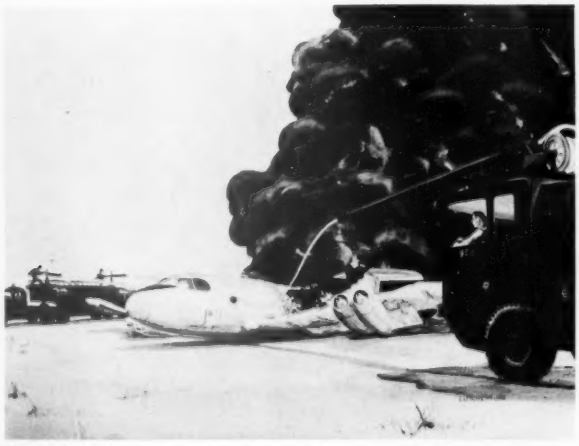
One of the first principles of training is proximity of the student. Bearing this in mind, it is small wonder that Capt. Robert H. Taylor is a member of the United States Air Force.

Captain Taylor, maintenance control officer of the 81st Tactical Fighter Wing, RAF Station Bentwaters, England, is the son of C. Gilbert Taylor, designer and original manufacturer of the famed Taylor, now Piper, *Cub* and Taylorcraft light airplanes.

Recipient of his first flight when only 19 months old, young Taylor barnstormed with family members while still a tot, took his first flying lessons at 14, and soloed three years later. He entered the Air Force during World War II and became a B-24 instructor. Captain Taylor was recalled during the Korean conflict and recently received his Regular commission.

His father, although no longer active with the companies which he founded, at one time enjoyed the distinction of having more aircraft bear his name than any other individual in aviation history.

HOW MANY CCs?



If testing proves successful, air bases may soon be equipped with a new type of "hypodermic."

Recently a patent was issued to Don Medlock of the Boeing Airplane Co. for a detachable auger which may be mounted at the discharge end of a fireproof hose, thus affording a method of fighting internal flames in aircraft accidents.

The installation would consist of a long, projecting boom, mounted atop the fire-fighting apparatus. In the event of a crash involving internal fire, the truck would be driven close to the plane and the auger rammed through the skin. The vehicle would then be backed off as the fireproof hose was played out, and once safely clear of the crash, would begin feeding chemicals internally to battle the blaze.

Installation of the novel equipment would in no way interfere with standard equipment for combatting the blaze externally.

YOU ASK IT

Q. Why have some overseas tours been increased from 18 to 24 months for unaccompanied personnel?

A. Prior to adoption of the new tour lengths, an *ad hoc* committee, representing all of the services was called to consider every phase of the proposed changes. Air Force members of that committee desired to retain the 18-month tour length in many areas. However, in the interest of harmony and to conform to DOD desires to establish uniform tours between all the services, the changes were accepted.

Q. I am a first lieutenant in the medical corps. I recently received orders to Guam. Am I authorized concurrent travel for my wife?

A. Yes. A recent amendment to AFM 75-1 authorizes automatic concurrent travel for all general officers, field grade officers, and medical officers ordered to that station. All other eligible personnel may apply for travel of dependents after they have secured private rentals following arrival in Guam.

Q. I have heard nothing regarding a testing or application period for the Regular warrant officer program this spring. What is the present status?

A. Early in December a message was dispatched from Hq USAF postponing at least the January to March application and testing period. Complete instructions regarding future submission of applications will be issued following a review of current personnel programs.

Q. I have been given the impression that the new mess dress uniform is, or is about to become, a required uniform for officers. Can you tell me on what date this requirement will become official?

A. For general officers, the uniform becomes a required item at appropriate social and official functions on March 15, 1959. The same requirement will be placed in effect on January 1, 1960 for all male officers and warrant officers assigned to duty with the office of the Secretary of the Air Force, Hq USAF, office of the Secretary of Defense, the Joint Chiefs of Staff, and other offices, boards, and commissions in the Central Control Group within the Washington, D. C. area. No other requirement has been published to date.

Q. I obtained my 7-level AFSC during the initial conversion in 1950. I have never taken an airman proficiency test. Under the new quality control program, will I be exempt or will I be expected to take such an examination?

A. You will be expected to take the test. This holds true for any airman who was awarded an AFSC prior to implementation of the testing program.

Q. What is the present status of the lightweight shade 84 blue uniform?

A. This proposed summer weight uniform is in service test status and is authorized to be worn only during such tests when approved by the Chief of Staff.

ACADEMY LIBRARY

Early this year the United States Air Force Academy passed another milestone along the road to becoming one of the Nation's outstanding institutes of higher learning with the official opening of the new Academy Library in its permanent quarters.

Described by a group of nationally recognized librarians and educators as "one of the most imposing collegiate libraries in the United States," the Academy Library occupies the largest portion of one wing of the main academic building.

Complete with specialized rooms, it covers more than 78,000 square feet on three floors. A marble spiral stairway, the only one of its kind in the United States, connects the floors.

Boasting a seating capacity of more than 800, it has been designed in such a manner as to provide complete flexibility in the arrangement of book-shelves and furniture.

Turntables with jacks and earphones reflect the increasing importance of listening aids in the field of higher education. Instruction will be available via this method in foreign languages, poetry, historical speeches, and related subjects. In addition, the music room is equipped with a stereophonic sound system.

One of the fastest growing libraries in the world, its collection presently numbers approximately 80,000 books and documents. Ultimately, the aim is to expand to more than 250,000, built primarily around the Academy's curriculum. All volumes will be catalogued in accordance with the Library of Congress classification system.

Using past circulation as a criteria, indications are that the Library will get better than average use in its new quarters. During the 1957-58 academic year, the record shows that the Cadets, while still in limited temporary quarters at Lowry AFB, used an average of 27.5 books each. Corresponding records indicate the national average for American colleges is 16.8 books per capita.

MOBILE RADAR BEACON

Although designed for permanent installation, usually in a concrete building, AACS technicians recently packed a massive radar beacon system and its supporting equipment into a pair of trailer vans. After thus effectively converting the system into a mobile unit, the finished product was rushed from Germany to Turkey for use.

USAFE officials had issued a call for "more positive air navigational control in the Middle East," and handed AACS the problem with a 45-day time limit attached. The order was forwarded to the European-African-Middle East AACS headquarters at Lindsey AB, Wiesbaden, Germany, and the search was on.

A dismantled RACON system was flown in from Burtonwood, England, reassembled, "flight" checked, and made air-transportable at the German base. The search then turned to finding a mobile shell for the newly-adapted unit. Two relics of World War II finally turned up in the form of trailer vans. After the bullet holes were patched, the RACON system was installed in one and the other was fitted out as a maintenance van.

A pair of Douglas C-124 *Globemaster IIs* were requisitioned and the units loaded for the flight to Diyarbakir, Turkey well within the established time limit.

Within days after the equipment was landed in Turkey, anxious officials in Wiesbaden received a cryptic wire—"RACON is installed and operating at the operating level."

UTILITY TRAINER

USAF has ordered an undisclosed quantity of North American T-39 utility jet trainers "off-the-shelf" and into production.

Designated *Sabreliner* by North American officials, the twin-jet aircraft will probably fill a great many roles in addition to passenger work during its stint in uniform. Boasting a cruising speed of approximately 500 m.p.h. and a 1,400-mile range, it can also double as a jet proficiency trainer, cargo plane for high-priority small bulk orders, navigation trainer, and tow target or chase aircraft. Purchase of the new aircraft is in line with the trend toward an all-jet Air Force.

In its "civilian" form, the *Sabreliner* carries a crew of two with space for four passengers. Modifications make it possible to double the passenger capacity.

The prototype is powered by two General Electric J85 turbojet engines and is 43-feet long with swept wings spanning 42 feet. Overall dimensions class it as smaller than most operational jet fighters.

The new aircraft was built at company expense to USAF specifications with the understanding that purchase orders would be "off-the-shelf" and in quantities governed by current needs.

BITS OF BLUE

. . . Command responsibility for Indian Springs AFB, Nev., will change next month. Presently assigned to the Air Research and Development Command, the base will become a Tactical Air Command installation on April 1.

. . . Hunter AFB, Ga., recently joined a growing list of USAF installations being serviced with jet fuel through pipelines. Estimates, based on previous experience, indicate that this transfer method will result in annual savings of more than $35,000. Hunter is the 18th base to be serviced in this fashion.

. . . Air conditioning has been authorized for installation in an additional 9,000 Wherry housing units at 17 bases during the current year. When completed, the two-year (1958-59) total will be approximately 28,000 units in 50 Wherry and Capehart projects.

. . . A letter of acceptability has been issued authorizing erection of 150 Capehart units at Robins AFB, Ga. At the same time, final bids for Capehart construction at Bunker Hill AFB, Ind., were being reviewed and a letter of acceptability is expected momentarily.

AIR AGE LIBRARY

PROFESSIONAL

Basic Aeronautical Science and Principles of Flight, Robert D. Blacker (American Technical Society, $5.95). The avowed mission of this book is to supply a background of basic aeronautics training for individuals who plan to engage in work concerned in any way with the manufacture, service, and operation of civil or military aircraft. Profusely illustrated and easy to understand, it explores the fundamental laws and principles of flight, discusses aircraft parts and components, and even describes the actions and inspections necessary for flying, from preflight inspections and taxiing through pilotage. Each chapter is followed by prepared examinations.

Air Force Bases (Military Service Publishing Co., $3.00). A directory of USAF bases and installations, domestic and foreign, with 10 categories of useful information about each base. These include housing, schools, commissary, transportation, churches, and similar items. Generally the same type of information is supplied about the surrounding communities.

Masters of Deceit, J. Edgar Hoover, (Holt, $5.00). This book rates as a "must" for professional military reading. An authoritative analysis on Communist operations in the United States, it chronicles the history of American Communism, its underground activities, and leaders. Mr. Hoover, head of the F.B.I., defines the Red goal in America as espionage, rather than sabotage.

USAF and Northrop Aircraft, Inc., officials have declared Lt. Larry C. Hewitt, Craig AFB, Ala., the winner of a contest to select a name for the Air Force's newest supersonic jet trainer. His winning entry dubbed the twin-jet trainer, *Talon.* Lieutenant Hewitt's effort won him a one-week, all-expense vacation to an area of his choice plus a $1,000 savings bond. The new trainer is equipped with jettisonable canopies, and individual ejection seats for both crew members. It is now in production.

Need for Officers in AFIT

The Air Force Institute of Technology is responsible for providing education and training to meet the USAF's professional requirements in scientific, technological, managerial, foreign language, medical and other areas.

Conducted in residence at the Institute, civilian universities and industrial organizations, the program is a two-way street. It contributes to the upward spiralling requirements for technically qualified officers while at the same time providing the opportunity for officers to further their formal education at the baccalaureate, master's, and doctoral levels.

Today more officers are needed to meet increasing quotas. Despite the obvious professional advantages inherent in the programs, AFIT courses for FY 1960 are scheduled to be only 85 percent filled.

To increase applications from qualified officers (at least 5,000 to 6,000 applications are needed annually), the Vice Chief of Staff has requested field commanders to provide special publicity on AFIT. Each officer possessing the prerequisites for participation is to be personally interviewed and encouraged to apply.

Application procedures and general eligibility criteria are contained in AFR 53-11, and details of each course are in the regular AFIT Information Brochure, USAF Training Prospectus and AFR 53-21. Further information can be obtained from base education services officers, personnel officers and by writing direct to the Commandant, AFIT, Wright-Patterson AFB, Ohio.

Broad categories of programs are engineering, bio-physical and physical sciences, arts and social sciences, management, training-with-industry, and academy instructors. Age limit for undergraduate programs is 37 years and for graduate programs, 40. Normally, officers completing AFIT are given a three year directed duty assignment within their newly acquired occupational field.

Selected officers attend on a full time basis, receive full pay and allowances, have tuition and fixed fees paid, and receive some reimbursement for books and thesis expenses.

Rated officers are attached to the nearest Air Force base for flying proficiency while attending school, but under the newly developed policies for assignment and training of rated officers, they will not be selected for technical or AFIT training leading to an AFSC identified as having no rated requirements. Officers already nominated or selected for training in such courses will be entered.

In the future, rated officers who volunteer for training into an area listed in AFM 26-1 as having no rated requirement must include requests for voluntary suspension from flying status. Suspension will not be effected until the officer is approved for the training.

Adapted from Vol. XI, No. 6, AF Personnel Newsletter

BASELINE USAF

SWAN SONG FOR A WARHORSE

Clark AB, P. I.--Reclaimed "bones" of 26 Douglas B-26 Invaders--all World War II and Korean conflict vets--should net the USAF nearly $200,000.

Disassembled at this Pacific station, the obsolete Invaders are sent to a nearby smelter, melted down, and cast into aluminum bars.

SECRETARY IN FLORIDA

Orlando AFB, Fla.--Secretary of the Air Force James H. Douglas was a recent overnight guest at this base following his appearance as guest speaker at a Military Appreciation Dinner, hosted by Governor Leroy Collins in Orlando.

Planned as an annual affair to honor the services' growing contribution to the state, the dinner is believed to be the first of its kind sponsored by a governor.

Secretary Douglas completed his short stay with tours of this MATS installation and of its SAC counterpart, McCoy AFB, nearby.

SWIMMING SAVE

Ft. Fisher AFS, N. C.--S/Sgt. Herbert H. Wheeler, 701st AC&W Sq., was recently awarded the Soldier's Medal, this Nation's highest peacetime award for heroism, in ceremonies here.

Risking his life, last summer Sergeant Wheeler swam out from shore to aid Miss Nancy Cox who was being swept away by a rip tide. After a hard struggle, he managed to swim to a nearby piling with the young lady in tow. Holding her behind him with one hand, he grasped the piling with the aid of the other and both legs, and shielded her from the barnacles with his own body until they could be lifted to the pier. Wheeler suffered mild shock, extreme exhaustion, and severe lacerations over his entire body.

DOUBLE SAVE

Travis AFB, Calif.--Three Soldier's Medals were awarded here recently at a joint Air Force-Army review.

All the medals were presented for joint participation in a daring rescue of two men, pulled from a burning aircraft by M/Sgt. Jesse Warrick, USAF, and SFC Edwin Berg and Sgt. Forrest James, USA.

Last June, a Douglas C-124 Globemaster, departing Travis, crashed shortly after takeoff with eight men aboard.

The three men immediately rushed to the scene and ascertained that two men were unaccounted for. They quickly made their way into the burning wreckage and succeeded in removing them.

SMALL WORLD

South Ruislip AS, England--Maj. Gen. William H. Blanchard, commander of SAC's 7th Air Division, is doing his bit to prove this is a shrinking world.

On a recent Sunday he chaired a conference at his own headquarters here. Monday, he attended a second conference, at SAC headquarters, Offutt AFB, Nebr. Tuesday, he was at Westover AFB, Mass., attending a third conference. Wednesday, General Blanchard returned to his own desk.

Total travel--more than 10,000 miles in less than four days.

CIVIL AIR PATROL

Featherweight Champ of Airpower

by

T/Sgt. John K. O'Doherty

Airman Staff

Illustration by C. J. Wood, Hq. CAP

BACK in the early days of World War II there was a fellow over at Rehoboth, Del., who was known to his friends as "Hold-Your-Horses" Hoiriis. How or why Hoiriis came by this unusual nickname is not altogether clear. He was not—to be sure—noted for timidity, and, as far as is known, he had no association with horses.

"Hold-Your-Horses" was the first aviator to fly a passenger over the Atlantic. That was in 1931, and later he further distinguished himself by flying the first airmail pickup route. February of 1942 found "Hold-Your-Horses" Hoiriis in charge of a makeshift airbase at Rehoboth as commander of the Delaware Wing of the Civil Air Patrol.

The Civil Air Patrol at that time was comprised of a pioneer group of colorful, civilian airmen dedicated to the service of a Nation suddenly plunged into war. They came from all walks of society—bankers, truck-drivers, salesmen, millionaires, and clerks. While "Hold-Your-Horses" Hoiriis set up the base at Rehoboth, Gill Robb Wilson, author and editor, established a similar installation at Atlantic City, N. J.

Mr. Guy P. Gannet, owner of a chain of New England newspapers, was an energetic figure in organizing the entire venture. Zack Mosely, creator of *Smilin' Jack*, flew with CAP in the early days, and later became commander of the Florida Wing. Statesman John W. Bricker of Ohio, Concert Pianist Jose Iturbi, and Actress Mary Astor were among the dozens of nationally known figures who patriotically turned from private interests to join their fellow-citizens in creating CAP as a going concern.

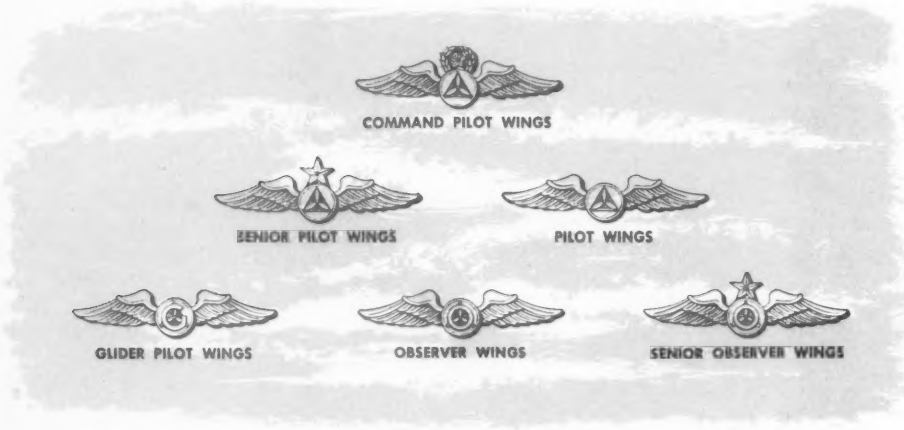
Many of the pioneers of CAP were people who were over age for the draft. The oldest pilot to sign up was A. I. Martin of Montour Falls, N. Y.—age 81. Others suffered from physical handicaps which excluded them from military service. George Copping lost both legs while working with the National Park Service. He survived to fly more than 1,000 hours for CAP using artificial feet to operate the controls. Mothers, sisters, and sweethearts of servicemen joined up to volunteer their skills. Still others of the colorful band of pioneers were youngsters marking time while waiting to be called into uniform. When CAP counted its dead after the war, the list included a man of over 50 and a boy of 19.

This volunteer organization of patriotic citizens devoted to promoting the interests of aviation was first organized in 1941 when the inevitability of American involvement in war became evident. The director of United States Civilian Defense, Fiorello H. LaGuardia—a former mayor of New York and a veteran pilot of World War I—was an enthusiastic supporter of the move to exploit the

wealth of "know-how" possessed by civilian airmen all over the country. A week before Pearl Harbor, LaGuardia signed a formal order officially establishing CAP as a part of the civilian defense team.

While the United States was still reeling from the shock of the Japanese attack in the Pacific, enemy submarines were reaping a rich and grisly harvest off the Atlantic coast. Merchant ships and tankers were going down at the rate of two and three a day—often within sight of shore—and the bridge of ships the President had promised to the Allies in Europe was precarious and shaky.

From a toll of 42 ships lost in March 1942 the score continued to mount until by May the loss was so severe that figures were not released. Conventional military forces, with men and machines spread dangerously thin in every theater, could devote only minimal effort toward combating the menace of the submarines. Undersea raiders were actually operating in the Connecticut and St. Lawrence Rivers and in the mouth of the Mississippi. It was a challenge which had to be met if the war effort was to get off the ground. As a result, the Civil Air Patrol antisubmarine patrol was inaugurated and CAP aircraft flew from dawn till dusk over the coastal waters.



The light, civilian aircraft owned by CAP members were first used on coastal patrol solely for purposes of reconnaissance. Pilot-observer teams in constant radio contact with shore bases summoned military bombers or Navy patrol boats to the scene when submarines were sighted.

In the space of a single night in the first week of May, 1942, U-boats struck at four ships in the deep water just off Lantana Beach, Fla. The *S.S. DeLisle* made it to the beach with a gaping hole in her side. A few miles to the south, CAP patrols found the other three victims. The *S.S. Amazone,* a Dutch freighter, was already under water with only the tip of her mast protruding above the waves. The American tanker, *S.S. Java Arrow,* was still afloat, but listing badly. Another U. S. tanker, the *S.S. Halsey,* was afire from stem to stern.

Flying out of Lantana in their *Stinson* a few hours later, pilot Tom Manning and observer "Doc" Rinker spotted a sub on the surface just off Cape Canaveral near the mouth of the Banana River. In its hurried scramble to escape detection the sub rammed its nose into a mudbank and became stuck fast, with propellers churning the water furiously. Rinker was screaming into the radio for bombers, destroyers, Marines—anything. For 42 agonizing minutes the little plane circled helplessly overhead, but before help arrived the monster worked itself loose and escaped into deep water. Sick with disappointment, the two airmen returned to the base to tell about the "big one that got away."

This incident came to the ears of Gen. H. H. Arnold, along with stories of similar experiences by other CAP fliers. Soon afterward the little planes were authorized to carry demolition charges and depth bombs. From 20 cents or so worth of miscellaneous scrap, a GI technician at Morrison Field rigged up a bomb sight which proved to be remarkably accurate, and CAP was in business for real.

By August of 1943 the offshore sea lanes had been virtually cleared of submarines. The Army and Navy were strong enough to resume normal responsibilities and as bombers, sub-chasers, and blimps took over the patrols, CAP closed the books on an impressive record tallied during 18 months of antisubmarine patrol. From 21 bases along the Atlantic coast and the Gulf of Mexico the patrol flew more than 86,000 missions, spotted 173 submarines, and summoned help for 91 vessels in distress.

The end of the submarine patrol by no means spelled *finis* to the usefulness of CAP. By this time the organization was under control of the War Department instead of Civilian Defense. But the members received no pay other than reimbursement for expenses incurred on official activities.

For the balance of the war, missions included border and anti-sabotage patrols, target towing (First civilian aviator to fly a target towing mission for Army anti-aircraft gunners was Frank Hlavacek, an undertaker from Evanston, Ill.), radio calibration flights, courier service, personnel transportation, and a large assignment in the area of recruiting aviation cadets. The merit of the CAP contribution to eventual victory is evidenced by the fact that 825 Air Medals were awarded to members for performance of duty during the war years.

Just as the Air Force has undergone a series of sweeping refinements since World War II, CAP has progressed to its present position and its relationship with the Air Force by a succession of stages.

In January of 1946 General Arnold called a conference of CAP leaders in Washington to map the future of the organization. Plans formulated at this conference—with the support of the Honorable Stuart Symington, Assistant Secretary of War for Air at the time—were crystallized some months later when President Truman signed an Act of the 79th Congress which incorporated CAP as a benevolent corporation.

Under this Federal charter, the organization undertook an ambitious program aimed at fostering the development of aviation generally through a number of broad educational projects, while at the same time assuming responsibility for creation of a civilian airpower structure capable of serving the public interest in time of disaster or emergency. The original charter, however, contained no provision for financial assistance from the government.

Shortly after the Air Force attained autonomy as an independent service, a new law was passed by the 80th Congress—May 1948—which recognized CAP as an official auxiliary of the Air Force, and authorized a limited degree of support. The extent of this support is strictly limited by law, and CAP continues to be a private corporation—not an official agency of the government.

Generally following the pattern of the regular Air Force, the present organizational structure of the corporation comprises 52 wings with subordinate groups and squadrons covering the geographic area of the 49 states, Puerto Rico, Hawaii, and the District of Columbia.

The 52 wing commanders comprise the National Board, governing body of the corporation, which meets annually to formulate policy and coordinate planning. A subordinate National Executive Board of representatives is established to act for the parent group at more frequent intervals.

CAP communications system is available for disaster relief.

National Headquarters at Bolling Air Force Base is headed by a general officer designated by the Secretary of the Air Force. As National Commander of CAP, Maj. Gen. Walter R. Agee is invested with administration of the affairs of the corporation. In addition, General Agee commands the Air Force personnel assigned to Headquarters CAP-USAF and the Air Force liaison offices maintained in eight area regions and at each wing. In the Air Force structure, Headquarters CAP-USAF is under command authority of Continental Air Command.

Illustration by W. E. Rowland, Hq, CAP

There are two types of membership in CAP organizations, and every member is a civilian volunteer. Senior members are adults—male or female—above the age of 18 years. Many of these, more than 16,000, are certified pilots; considerable numbers own their own aircraft, while others contribute skills in navigation, communications, or other fields of endeavor necessary to a well-rounded airpower structure. Cadet members are youngsters of both sexes, under the age of 18, who have demonstrated an interest in some phase of airpower activity.

Members of CAP hold military-type rank in gradations similar to the Air Force, but CAP rank holds no validity if the member should enlist or be commisisoned in the military forces. Membership does not relieve any responsibility for military service established by law. The uniform worn during duty sessions and at assemblies is identical with that of the Air Force save for distinctive insignia.

All CAP members serve without pay, and dues are collected to support the organizations. The cost of uniforms is borne by individuals, or is sometimes financed by group fund-raising activities. It has been estimated that membership in CAP may constitute a private expense of about $100 annually for senior members.

Squadrons of CAP can muster some 4,400 aircraft to meet an emergency. These include the privately owned property of the members, and numbers of planes owned by the corporation, including more than 700 light liaison craft donated by the Air Force. These aircraft, together with hundreds of pieces of ground equipment and an extensive communications system which includes more than 8,000 mobile stations, stand ready to assist the military services or civilian communities in event of fire, flood, crash, rescue, or other emergency. Case records of a 12-month period reveal that CAP search crews flew 15,240 hours in their single-engine light planes—more than a million and a half miles.

Almost every day in the year, somewhere in the United States or its territories, CAP volunteers are going about the business of saving lives or protecting property On official

missions authorized by the Air Force, CAP members are reimbursed for gasoline and oil consumed. The year's operation cited above cost the American taxpayer $36,576 or about $2.40 per flying hour. If the same activity had been carried out by the Grumman SA-16 operated by the Air Rescue Service cost would have been $1,706,000.

When the Federal Aviation Agency was created in 1958 to assume responsibility for regulation of air traffic and control of air space one of the first important steps taken by Lt. Gen. Elwood R. Quesada (USAF Ret.) was to enlist the aid of CAP.

Beginning early in 1959 CAP cadets will conduct a coast-to-coast survey of pilots of private, nonscheduled, and transient military aircraft to determine who is flying where, when, and how often. Hundreds of pilots will be interviewed at 245 civilian airports in 21 states, and the resulting data will be electronically processed for use by FAA.

With respect to the future peace, leadership, and continued progress of the United States, the most notable area of endeavor by CAP is that devoted to preparing young men and women for attainment of full stature in the age of airpower. Nearly 40,000 boys and girls of high-school age all over the country hold membership in CAP squadrons and participate in a variety of programs designed to promote technical education, breadth of perspective, and good citizenship in accord with American traditions.

At squadron training assemblies held in evenings or on weekends these thousands of young people study the fundamentals of aviation and airpower technology in the CAP Aviation Education Program.

This course, or series of courses, is taught by senior members, and covers a range extending from the basic principles of flight to rocket propulsion, career opportunities, and the impact of airpower on the sociological and political problems of the world.

Curriculum covered in these classes is developed at CAP National Headquarters, and is presented in seven handsome text books, augmented by teachers' guides, work books, and film-sound strips which illustrate the material dramatically and effectively.

Text books and supporting material are sold to the squadrons at modest cost, and receipts are deposited in a revolving, self-perpetuating fund which continues to produce and replenish material.

Various activities in the nature of practical training are connected with each phase of the academic course, including such popular adventures as the annual summer encampments held at Air Force bases. Upon successful completion of all phases of instruction—as evidenced by passing an examination—the cadet is awarded the CAP Certificate of Proficiency.

The Aviation Education Program, in addition, extends far beyond the confines of the firehouses, armories, airdromes, or lodge halls where weekly squadron meetings are held. Scores of elementary and secondary schools across the Nation are cooperating with CAP by making the course-content available to their students. In some cases the study of airpower is offered as an elective subject, while in others teachers use the material to enrich the curricular content of conventional courses of study. Students of the sciences, literature, and even music or art are encouraged to investigate the influence of airpower on each particular field of interest.

Outstanding CAP cadets may qualify for jet orientation.

Many schools accommodate the needs of students through club-type activities, which are usually based on an interest in radio, electronics, or rocketry. Recent scientific accomplishments in the United States and elsewhere have generated an avid interest in missiles and space on the part of young people. The Air Force, for quite practical reasons, encourages these junior scientific groups whenever possible, and a recent regulation (AFR 190-26, 1 Oct. 58) cites the facilities of CAP as a source of study material and expert guidance.

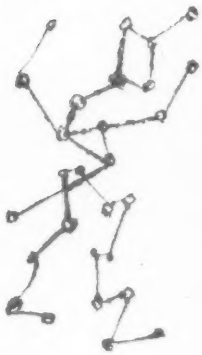
The International Air Cadet Exchange Program is a CAP special cadet activity designed to build citizenship and mature understanding. This program had a modest beginning 10 years ago with an exchange of cadets between CAP and the Air Cadet League of Canada. Since that time the program has expanded to embrace 22 countries of North, South, and Central America, Europe, and the Middle East.

Under this plan, carefully selected cadets are chosen to visit foreign countries as guests, with similar numbers of air-minded youngsters from overseas visiting the United States.

It is difficult to measure the accomplishments of the CAP Aviation Education Program in tangible terms. There are 119 veterans of CAP at present enrolled at the Air Force Academy, and hundreds of others are serving with the active Air Force. At control towers and weather stations in civilian airports all over the country, expert technicians apply their skills to keep the lifeblood of airpower flowing. Still others in workshop and laboratory are unlocking the doors to the secrets of tomorrow. When the first spaceship lands on the moon, there's a possibility that the pilot may still have a worn and faded CAP membership card in his wallet.

The qualities of partiotism and citizenship, together with the self-confidence engendered of knowledge, are part of the treasure which one generation passes on to the next.

Photo by A/1C Reginald W. Lawley
Laughlin AFB, Tex.



These airmen are a decontamination team of Laughlin's Chemical, Biological and Radiological (CBR) Squad. They are trained to handle most situations where dangers of contamination exist.

Accidents and the Atom

Only a small percentage of people in the Air Force come in direct contact with the special weapons which have become accepted as necessary items of military equipment. Some of the information regarding modern armament is classified, and this, coupled with the normal respect to which any type of ammunition is entitled, has clothed the entire subject in an aura of mystery.

It is only natural to wonder: "What happens if some butterfingers drops one of these things on a concrete ramp?" "Suppose a truck loaded with nuclear bombs should skid off the road?" Most important of all, "What happens in case of an aircraft accident in which atomic weapons are involved?"

As a matter of fact, ground or air accidents involving nuclear weapons entail no substantial immediate hazard greater than that surrounding a mishap with conventional explosives. "Butterfingers" may bruise his foot, and aircraft accidents are always dangerous, but the chances of an unintentional nuclear explosion are so remote as to be negligible. The Air Force has been in the atomic weapons business for about fifteen years, and the number of accidental or unintentional nuclear explosions to date is zero.

In the United States, atomic weapons may be transported by aircraft, truck, train, or naval vessels. In each case weapons are installed in special containers which are secured to the vehicle by tie-downs and mountings specifically designed for the purpose. Safety measures incorporated in the engineering of the weapon further extend the odds against nuclear explosion even in case of major accident.

In combat aircraft carrying nuclear weapons, a specific sequence of positive actions is required before the bomb is ready for detonation.

Most atomic weapons contain conventional high explosive in varying amounts up to several hundred pounds. In the event of aircraft accident, this high explosive—coupled with the hazard of volatile or explosive airplane fuel—constitutes the most probable danger. The possibility of nuclear yield can be discounted, and should not be permitted *per se* to interfere with rescue efforts. A fire involving atomic weapons should be treated as a fire involving an aircraft carrying conventional explosives.

As a result of detonation of the high explosive in an atomic weapon, or of burning, small particles of plutonium may be released into the air or in the smoke cloud. Plutonium is not a hazard when it remains outside the body as it emits only alpha rays which do not penetrate the skin. (This dispersion of plutonium should not be confused with atomic fall-out and the harmful beta and gamma rays following nuclear reaction.)

Particles of plutonium may enter the body by breathing, swallowing, or through cuts or breaks in the skin. Since the plutonium is in highly insoluble form, only a small percentage will be retained by the body. The amount of plutonium likely to be absorbed in the course of any one incident is not considered to be a source of serious injury, but the cloud of toxic and caustic smoke should be avoided. Any rescue attempt should be made from up-wind, and even an improvised face mask may be helpful.

In an open area there is danger from the blast effect of conventional high explosive at 1500 feet, and even at that distance secondary objects propelled by the explosion can cause injury or death.

Once the rescue attempt has been made—or recognized as impossible—the best policy for anyone other than a professional in the field of rescue or firefighting is to get out of the way, notify authorities, and then keep others out of the way.

The Chief Paid a Visit

General Thomas D. White stops off in the Philippines

In an open-collared, short-sleeved uniform, the Chief toured sprawling Clark Air Base last December from the many-winged hospital and the Air Defense Control Center to the flight line. During an informal inspection of the maintenance areas the General paused to talk with some of Clark AB's officers and airmen.

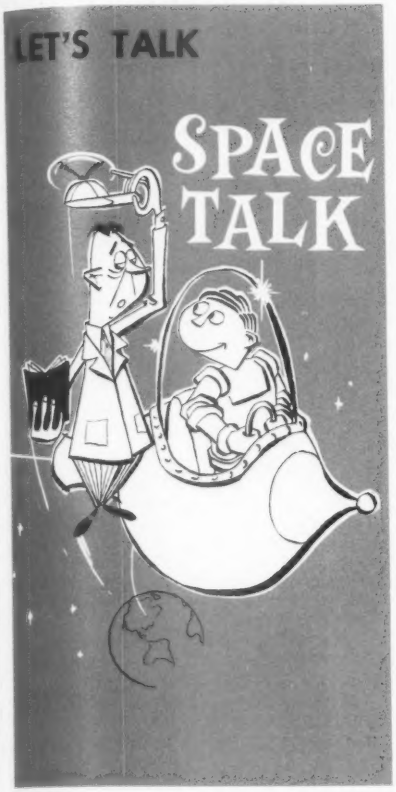
A few minutes later he dropped in at the off-base quarters of Senior Master Sergeant and Mrs. C. E. Mills for a serious chat about family housing and the down-to-earth living problems in the Philippines.

During his fast six-hour visit to Manila in the afternoon,

General White, with other dignitaries, visited the U. S. Embassy; lunched with Brigadier General Pedro Q. Molina, his Philippine counterpart; presented General Molina with the U. S. Legion of Merit; paid a visit to Philippine Secretary of Defense Jesus Vargas; and reviewed three honor guards—including the Presidential Honor Guard—before winding up in the ornate State Reception Room of the Presidential Palace, home of President Carlos P. Garcia.

He had a few minutes quiet, private conversation with the Philippine President, then a group of diplomatic and military officials and their wives gathered to watch President Garcia present General White the Philippines Legion of Honor with the rank of Commander.

The medal was awarded, the citation said, for "eminently meritorious and distinguished services rendered to the Republic of the Philippines" by General White while participating in air assaults against the Japanese on New Guinea, Borneo, and the Southern Philippines that contributed to the early liberation of the Philippines. This happened in 1944 when General White was Deputy Commander of 13th Air Force. He was also cited for his support of measures since then that expanded and modernized the Philippine Air Force and for his invitations to PAF personnel to observe and study U. S. air defense techniques and operations; all of which "further strengthened the bonds of friendship and affection that bind the Philippines and the United States."



A Down to Earth Glossary of Aeronautical Terms

by Dr. William J. O'Donnell

Chief Engineer, Aircraft & Missile Development
Republic Aviation Corp.

We've hardly grown accustomed to 1,300-mph jets and already we've begun to talk matter-of-factly about 18,000 mph hypersonic globe-circling bombers, space stations and million-pound-thrust engines.

But the average person's 15,000-word vocabulary is hard put to keep pace with such technology. The space scientists and engineers have played Scrabble with our language, introducing a whole new subdialect of polysyllabic jargon.

Today we have to cope with the likes of magnetohydrodynamics, aeroembolism and bioastronautics, or technical slang like auntie, zip fuel or lox. The mixture of gases surrounding us which we've been happy and content to call "air" has been compounded into atmosphere, chemosphere, ecosphere, exosphere, ionosphere, and ozonsphere not to mention mesophere, troposphere, stratosphere, thermosphere and space.

This oral form of technological anagrams can be good fun, but it can give an inferiority complex to reasonably intelligent people.

Thus, we felt somewhat obliged to try to translate some of the more frequently used technical terms of the space scientists.

This list does not guarantee you an "A" in Astronautics, nor does it profess to cover all of the terms.

If it does nothing more than aid you in a better understanding of the news reports on missile, rocket and space activities, it will have served its purpose.

ABLATION. Melting of nose cone materials during re-entry of space ships or vehicles into the earth's atmosphere at hypersonic speeds.

AERO-EMBOLISM. The gas bubbles (nitrogen) you'd get in your blood if you flew at high altitudes without a pressure suit. Spaceman's version of "the bends."

AEROPAUSE. A portion of the upper region of the atmosphere which does not give any aerodynamic support of either manned or unmanned flight.

AIR-BREATHER. A missile or plane whose fuel is oxidized by "breathing" in air.

APOGEE. The point farthest from earth in the orbit of a missile or satellite.

ASTEROIDS. Numerous small planets revolving around the Sun, largely between Mars and Jupiter.

ASTRIONICS. The science of adapting electronics to space flight.

ASTROBIOLOGY. The branch of biology concerned with study of plant life on planets.

ASTRONAUT. A homo sapiens who flies through space.

ASTRONAUTICS. Broad term for the whole business of designing, building and operating guided missiles or space vehicles.

AUNTIE. Nothing female here, just some slanguage for "antimissile missile."

BACKUP. A substitute rocket or missile, or alternate procedure, to save time in the event of a delay or failure in launching.

BIOSATELLITE. A satellite that carries an animal or plant life.

BIOSPHERE. What we're all living in—that part of the earth and atmosphere in which plants and animals live.

BIPROPELLANT SYSTEM. A propellant system composed of two parts—usually a liquid fuel and liquid oxidizer which combine in a combustion chamber to generate thrust.

"BIRD." In astronautics language it refers to inanimate objects that fly, i.e. missiles, earth satellites, etc.

BLOW-DOWN TUNNEL. A wind tunnel that operates by releasing stored gas (air) from a reservoir.

BOATTAIL. The cylindrical, tapering tail section of any missile. It helps reduce over-all aerodynamic drag of airframe.

BOOST-GLIDE VEHICLE. A winged vehicle that is boosted to a desired height and speed by means of rockets, then returns to earth as a glider.

BOOSTER. A propulsion unit which gives a plane, missile or spacecraft that temporary extra push needed at take-off.

"BRAIN." Generally refers to the man-made kind—the navigational units or systems.

CAPSULE. A fancy term for cockpit in high speed aircraft and space ships. It's the enclosure for the pilots and crew. May also be used for emergency escape in which case it protects the pilots.

CELESTIAL GUIDANCE. A form of navigation using the celestial bodies as reference points much the way early sailors used the North star.

CIRCUMLUNAR. Trips or missions in which a space ship and/or missile will circle the moon and return to earth.

CISLUNAR. Space between the earth and the orbit of the moon.

CLOUD CHAMBER. The path of subatomic particles are made visible in this kind of chamber by depositing a "cloud" of water particles on them.

COMET. A loose body of gases and solid matter spinning around the sun.

COSMIC RAY. Any ray of high penetrating power produced by transmutations of atoms in outer space.

DECAY. Space talk meaning loss of energy, when referring to an orbiting satellite.

DOG HOUSE. The mound-like housing outside of a rocket which houses instruments.

DRONE. A remote-controlled pilotless plane.

DESTRUCT. The deliberate exploding of a missile after it has been launched, perhaps because it has veered from its plotted course (i.e. an intentionally aborted mission).

DRY WEIGHT. The weight of a rocket or missile without its fuel.

DYNA-SOAR. A boost-glide, orbital space craft. Name derived from contraction of dynamic-soaring.

EMISSIVITY. The ability of a surface to effect thermal radiation.

ESCAPE VELOCITY. The initial speed needed to overcome the pull of gravity in unpowered flight. Can also apply to the pull of planets or other bodies.

EXOSPHERE. The outermost fringe of the atmosphere.

EXOTIC FUEL. A fuel which uses chemicals having a very high rating such as liquid oxygen.

FREE RADICAL. An atom or a group of atoms (atomic hydrogen, atomic nitrogen) broken away from a stable compound by application of external energy. They may remain in their free state for extended periods.

FISSION. Splitting an atom with resulting production of nuclear energy.

FREE FALL. Space term referring to a condition in space in which things act as though they were free from the influence of gravity.

FUSION. The combining (fusing) of atoms to release energy.

GALAXY. The group of several billion suns, star clusters, etc. Most recognizable is our own galaxy, the Milky Way. Also refers to any groups of stars forming independent units.

GANTRY. Name of special crane (gantry crane) or scaffold used in missile and vehicle launchings.

GIMBALLED MOTOR. A rocket motor mounted on a movable frame, or gimbal. It corrects for pitching and yawing rotation movements to steer a missile.

GRAIN. Sounds familiar but means something else. It's the body (i.e. mass) of a solid propellant used in a rocket. It is tailored or shaped to the rocket's requirements to burn without surges.

GRAVITY. As the dictionary says, "The force which tends to draw all bodies in the earth's sphere toward the center of the earth."

HUMAN ENGINEERING. Does not mean the designs of humans, but rather the psychological analysis of crew problems in astronautics (and aeronautics, too) so that aircraft and spacecraft can be designed to meet these requirements.

HYPERSONIC. Speeds faster than Mach 5, or five times or more the speed of sound.

SPACE TALK

HYDRASONE. One of the "exotic" fuels mentioned previously.

HYDROCARBON FUEL. A fancy term for gasoline or kerosene.

HYPOXIA. Medical term covering scarcity of oxygen in the air being breathed.

INERTIA. The tendency of an object to remain put; or if moving to continue on in the same direction, unless disturbed by an outside force.

INERTIAL GUIDANCE. A sophisticated automatic navigation system using gyroscopic devices, etc., for high speed aircraft and missiles (and space ships) which absorbs and interprets such data as speed, position, etc., and automatically adjusts the missile or spacecraft to a predetermined flight path. Essentially, it knows where its going and where it is by knowing where it came from and how it got there. It does not give out any signal so it cannot be detected by radar or jammed.

INTERSTELLAR SPACE. The region between the stars in a galaxy.

INTERPLANETARY SPACE. The region between planets.

IONIZE. Freeing an electron from an atom or molecule (by such means as X-ray bombardment) thus transforming the parent body into a positive ion. The atom or molecule to which the freed electron attaches itself, or the electron itself, becomes a negative ion.

ION. An electrically charged atom or group of atoms.

IONOSPHERE. The outer region of the atmosphere beginning about 25 to 50 miles up, depending upon the theory you favor.

INFRA-RED GUIDANCE. A system for reconnaissance of targets and navigation using infra-red heat sources.

IONIC PROPULSION. A system which frees ions from electrons and boosts them electrically into high velocities to be harnessed for thrust to power a rocket missile or spacecraft.

ION ENGINE. A type of engine in which the thrust to propel the missile or spacecraft is obtained from a stream of ionized atomic particles, generated by atomic fusion, fission or solar energy.

ISOSTATICS. Under equal pressure from every side.

JET. An aircraft or missile which breathes air and is propelled by the thrust of exhaust gases. Differs from a rocket in that a rocket carries its own oxidizer and doesn't need to breathe air.

JET STREAM. Air currents high up which move at speeds over 300 mph.

KINEMATICS. A study of motions.

KILL. Destroying a missile or enemy aircraft.

LAUNCH PAD. The steel and concrete base from which a missile is launched.

LIGHT YEAR. Some 6,000 billion miles (the distance light can travel in one year's time). Used as a unit of astronomical distance.

LIQUID OXYGEN. By supercooling and storing under pressure, oxygen becomes liquid. It is used then as an oxidizer in a liquid-fuel rocket.

LIQUID PROPELLANT. Rocket fuel using one or more liquids in a mixture (i.e. fuel, oxidizer and an additive).

LIQUID ROCKET. Surprise—a rocket that uses liquid fuel!

LOX. Nothing nutritional — short for Liquid Oxygen, Explosive.

MACH. A unit of speed measurement named after Austrian physicist Ernst Mach. Refers to the speed in relation to the speed of sound. Thus Mach .5 is half the speed of sound and Mach 5 is five times the speed of sound. (At sea level the speed of sound is 760 miles per hour.)

MAGNETOHYDRODYNAMICS. A tongue-twisting combination of several existing words to describe the study of the interaction between magnetic fields and electrically conducting fluids and gases.

METEOR. Small, interplanetary bodies which fall into the Earth's atmosphere and burn up by friction. They're "shooting stars."

MINITRACK. Short for minitrack radio. Refers to the track of a miniature transmitting set emitting telemeter-type signals.

"MOON SUIT." Recommended wearing apparel in high altitude flights and space tests. It's of special, inflatable design covering the entire body.

NOZZLE BLOCK. The "throat" of a wind tunnel which regulates the air flow and velocity.

ORB. A celestial sphere, a round body like a moon, planet or manmade satellite.

ORBIT. Not a little piece of an orb, but the path such a body follows in its revolution about another body. (It's unpowered.)

ORBITAL BOMBER, GLIDER OR ROCKET. In each case, refers to a vehicle with the capability of reaching orbital speeds, circling the earth one or more times "in orbit" then gliding back to base.

OUTER SPACE. Commonly used to identify the space above the earth's atmosphere.

OXIDIZER. A substance, generally liquid oxygen, that combines a fuel to produce heat and gas, as in the case of a bipropellant rocket.

PARSEC. A unit of measure for interstellar space. Is the equivalent of 3.26 light years.

PERIGEE. The point in orbit of a missile or satellite closest to earth (vs. apogee).

PHOTON ENGINE. A type of rocket or missile engine in which the thrust is derived from harnessing a stream of light rays.

PICK-UP. Not what you think, sir! It's a sensing unit which "picks-up" and measures such variables as temperature, pressure and velocity during flight.

PLANET. A heavenly body—usually shines by refected light—and orbits around the sun or other stars.

PLASMA JET. A device for producing a stream of very hot or ionized gas.

PLASMA PHYSICS. The science dealing with the study of fully ionized gases.

REACTION MOTOR. An engine which compresses the incoming air, generally a turbojet.

REACTION ENGINE. An engine in which thrust is generated by expelling a stream of moving particles rearwards.

RAMJET. A reaction type engine which depends upon forward velocity for the intake and compression of air which is burned with fuel to create jet thrust.

RELAXATION TIMES. Not a planetary coffee break, but the period of time necessary for material to return to normal state following stress or a temperature change.

ROCKET. A reaction type vehicle which burns either liquid or solid fuel to produce hot gases which are ejected from a nozzle. Rockets carry their own oxidizer and therefore don't need air for burning their own fuel.

SATELLITE. An unpowered object in space which revolves about another body.

SATELLOID. Science fictionese for a manned vehicle, half airplane and half satellite. It's designed to orbit then return to Earth.

SENSIBLE ATMOSPHERE. That which you can feel. It offers resistance.

SIDEREAL. A measurement of time. A sidereal day, for example, is the time it takes the earth to make a complete revolution measured from the stars. A sidereal day is four minutes shorter than our day (which is called a solar day).

SOLID ROCKET. Not the opposite of a hollow one, but refers to a rocket propelled by a solid rocket fuel.

SPACE. The area above the Earth's atmosphere extending into infinity. The precise point at which it begins is indefinite.

SPATIAL BODY. A space body, what else?

SPUTNIK. Breathes there an American who doesn't know this is the Russian name for its manmade Moon or satellite?

STATIC FIRING. Testing a rocket motor on the ground.

STOL. Short for Short Take-off and Landing.

STRATOSPHERE. A stratum of the atmosphere lying immediately above the troposphere and immediately below the chemosphere. Clear? In other words the region about 7 miles up extending for some 19 miles or 50 miles, depending upon which meteorologist you're talking to.

TELEMETER. Transmitting data over great distances by means of electronic instruments.

TERRESTRIAL SPACE. Space near the Earth, or close enough so that the attraction of the Earth is dominant.

TROPOSPHERE. The lower area of the earth's atmosphere. It ranges in altitude from the Earth to 60,000 feet at the equator to only 30,000 feet up at the poles.

THRUST. The propelling force exerted on a reaction engine by its exhaust.

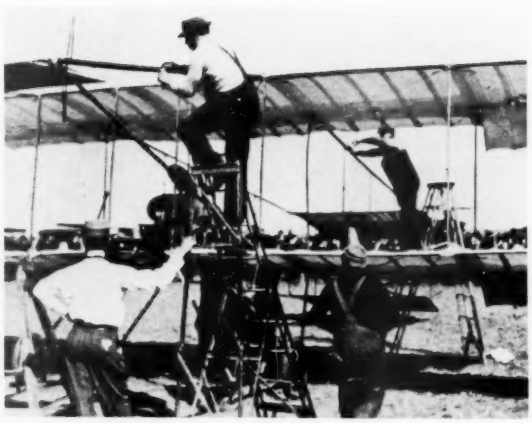
UMBILICAL CORD. Any one of the servicing fluid or electrical lines connecting a rocket or missile with the ground units. It is quickly detached at launching time.

UNIVERSE. The entire spatial cosmos—or, more simply, infinite space.

UPPER AIR. The atmospheric region embracing the ionosphere and the exosphere.

WEIGHTLESSNESS. The obsence of any apparent gravitational pull on an object.

ZIP FUEL. A term partially borrowed from teen-age jargon (i.e. zip guns) but here refers to special high-energy jet engine fuel.



Maj. Gen. Benjamin Foulois today. He well remembers the day.

by Carmen C. Compney
Fort Sam Houston, Texas

Ben Foulois: One-Man Air Force

Fifty years ago he was America's airpower

In December 1909, at Fort Myer, Va., Lt. Benjamin D. Foulois was called before Gen. James Allen, Chief Signal Officer.

"Foulois," General Allen said, "the government is shipping its airplane to Fort Sam Houston, Tex. You're going along. Take plenty of parts and teach yourself how to fly."

Lieutenant Foulois had flown before. He had logged 182 minutes flight time with Wilbur Wright and Frank Humphreys before the machine had become Government property, but neither instructor had permitted him to make a takeoff or landing. He would be strictly on his own at Fort Sam!

The Army's first (and only) flying machine, in accordance with Government specifications, could carry two men 125 miles and attain a top speed in excess of 40 m.p.h. It had been designed to permit rapid disassembly and assembly for transportation in Army wagons.

On February 10, 1910, the airplane was received in San Antonio by the Wells Fargo Co. A corporal, four privates, and a civilian mechanic reported for aviation duty at Fort Sam Houston on the same date. Foulois arrived to take command of his tiny air force four days later.

By March 1 everything seemed ready for a takeoff attempt. Then, as a crowd of spectators, military and civilian, gathered to watch the flight, a deficiency was detected in the launching mechanism and takeoff was postponed.

On the following morning some 2,500 persons were on hand to witness another attempt. The little air force placed its flying machine on the launch rails and the operator got aboard. The engine was started and heavy weights on the massive launching device were dropped. The plane sped down the rails and leaped into the air. The crowd cheered.

Foulois circled the area several times, then landed, barely missing an automobile which had blundered into his landing path. The landing was a success. For the first time in history an American military man had flown in a Government-owned airplane.

The lieutenant had one minor landing accident that day, but he came out of it uninjured. On March 12 he made five flights. On the last of these a sharp gust put the machine into a steep dive and threw him out of his seat. Two truss wires saved him from falling overboard. He got back into his seat, pulled out of the dive, and landed safely. Later a field artillery battery saddler made him a safety belt from an old trunk strap, and this became a permanent accessory.

The first four months of learning how to fly exhausted the $150 allocated for maintenance and $300 of his own funds, yet Foulois continued to build his skill and seek new ways to improve the airplane. He wrote the Wright brothers and through their correspondence improved his flying. In August 1910 he was able to abandon use of the cumbersome launching device after a successful test flight with a tricycle wheel gear he and two of his men had developed.

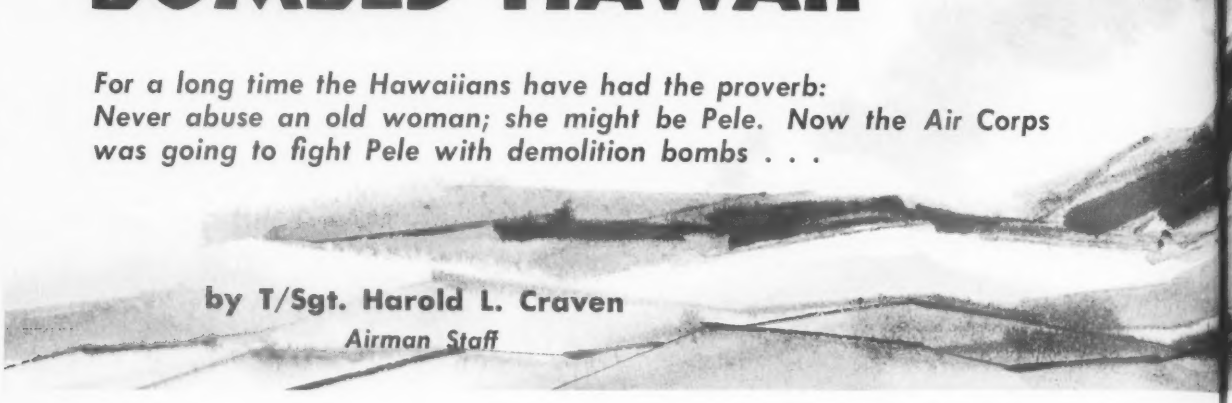
One of the chief handicaps faced by the lieutenant was the fact that the plane spent 75 percent of its time in the repair shop. This situation was alleviated considerably when Robert F. Collier loaned his Wright airplane to the Signal Corps for use by Foulois. In March 1911 Congress approved and appropriated $125,000 for immediate purchase of five new airplanes, and soon Foulois was joined by others who were to shape the destiny of military aviation.

Foulois commanded the First Aero Squadron in action against Pancho Villa in 1916, served as Chief of the Air Service of the American Expeditionary Forces in World War I, and became Chief of the Air Corps prior to his retirement in 1935. Although he served with distinction throughout his military career, he will probably be remembered longest for the series of flights which began when the general said:

"The Government is shipping its airplane to Fort Sam Houston, Tex. You're going along. Take plenty of parts and teach yourself how to fly."

THE DAY THE AIR CORPS BOMBED HAWAII

For a long time the Hawaiians have had the proverb: Never abuse an old woman; she might be Pele. Now the Air Corps was going to fight Pele with demolition bombs . . .



by T/Sgt. Harold L. Craven
Airman Staff

MAUNA LOA, on the island of Hawaii, discharges more lava and provides a more spectacular display of natural fireworks than any other volcano in the world. According to legend it erupts only at the bidding of the volcano goddess Pele. In an eruption in 1926 the entire village of Hoopuloa was destroyed by molten lava.

Now it was the evening of November 21, 1935, and, heralded by an earthquake and a tidal wave, Mauna Loa had erupted again. On the following morning pilots of the 6th Pursuit Squadron, based at Luke Field, Oahu, flew over the flaming mountain to investigate and report their findings to Dr. T. A. Jaggar, U. S. volcanologist.

The eruption had occurred along the side of the mountain rather than from the summit crater, Mokuaweoweo. From a huge opening five miles below the crater a river of molten lava a half mile wide was spewing forth and creeping toward the lowlands in two major divisions. It was an awesome sight from the air. Great fountains of lava, caused by exploding gases, reached heights of 200 or more feet.

Dr. Jaggar, his assistant, H. H. Waesche, and John E. Doerr, Jr., Hawaii National Park naturalist, were flown over the mountain in an Air Corps bomber that morning to make an official map of the lava source. Lt. Karl Truesdell, meanwhile, flying solo in a Boeing P-12, climbed to more than 14,000 feet to inspect the summit crater. In Mokuaweoweo's northwest side he found a constantly growing pool of lava. He immediately radioed this information to Air Corps officers on the ground who were in contact with the scientists at nearby Kilauea Volcano Observatory. At 11 a.m. Maj. Gen. Hugh A. Drum, commanding general of the Hawaiian Dept., U. S. Army, several members of his staff, and Lawrence M. Judd, one-time governor of Hawaii, inspected the lava flow from General Drum's OA-3 amphibian.

All the observers agreed that Mauna Loa presented no immediate danger to life or property. Its lava flow was still high on the mountainside, and since it is the nature of lava to solidify as it cools, its rate of descent would decrease. At this point no one could be certain how long the flow would continue or what its ultimate direction would be. One fact was obvious: as long as there were airplanes available, Madame Pele would have few secrets.

On November 27 observers noted a new outbreak at the 9,000-foot level. Molten rock, either from a new source or a continuation of the original source, was spewing forth from the mountain and descending toward Humuula, overlapping the path another lava flow had taken in 1843.

An O-19 observation plane, piloted by Maj. Lucas V. Beau, Jr., carried Secretary of War George H. Dern through snow flurries above Mokuaweoweo crater and over active firepits on the mountain slopes on the morning of December 5. Other members of the secretary's party were given an aerial view of the lava flow from Air Corps planes piloted by Capts. Charles F. Born and Fay R. Upthegrove and Lts. Daniel A. Cooper, Byram A. Bunch, and Carlyle W. Phillips.

On the following day secretary Dern was guest of honor at a luncheon in Hilo. At the luncheon Dr. Jaggar proposed the construction of a mountain causeway to divert future lava flows toward wilderness areas. He said it was likely that future activity would follow paths made by 1852 or 1855 flows, thereby endangering Hilo. Army bombers, he said, could aid in an emergency by dropping bombs in the path of the flow, causing the lava to pile up

and change its direction, The secretary assured Dr. Jaggar that emergency assistance would be made available whenever needed for protection of life or property.

The lava flow reached a critical stage on December 9 and began spreading out over a wide area beneath a glassy crust. Nine days later it began forming a huge lake under a shell of solidified lava. A sudden advance in the flow occurred on December 20, burning grass and forest. Then a huge lava lake suddenly drained eastward toward Hilo, and the flow moved toward the city at the rate of one mile a day on a downgrade of 157 feet per mile. The steepness of the slope increased as the lava advanced and Dr. Jaggar estimated that it would reach a point at Kaumana Road, near Hilo, by January 9. The flow now posed a threat to the headwaters of the Wailuku River, source of Hilo's water supply.

Keystone Bomber

Edward C. Wingate, Hawaii National Park superintendent, announced on December 23 that an attempt to change the lava's course, by dynamiting or aerial bombardment, would be made. He said this would be done as an experiment rather than as an emergency measure.

An OA-3 amphibian, piloted by Lt. Benjamin J. Webster, carried Capt. Joseph J. Ladd, bombing officer, and Lt. J. W. Cox of the 3rd Engineers, from Wheeler Field, Oahu, to Hilo on December 24. Later that day Col. Delos C. Emmons, Hawaiian Dept. air officer, and Lt. Col. Virgil L. Peterson, commander of the 3rd Engineers, flew over the volcano, then conferred with Dr. Jaggar. Following the conference Col. George S. Patton, Jr., Hawaiian Dept. intelligence officer, announced that bombs would be dropped on the lava on December 27 at points selected by Dr. Jaggar.

By December 26 the danger to Hilo's water supply was real and there was some possibility of danger to the city. At 8:30 a.m. 10 Keystone bombers, two observation planes, two amphibians, 20 officers, and 33 enlisted men, under command of Lt. Col. Asa N. Duncan, were en route from Oahu to Hilo Airport. The bombers carried 300-pound practice bombs which were to be loaded with sand and black powder at Hilo. Twenty 600-pound demolition bombs had been sent ahead on the Army Transport *Gen-*

eral Royal T. Frank. The practice bombs would be used for sighting; the 600-pounders would do the work.

Upon arrival at Hilo, pilots and bombing officers went into consultation with Dr. Jaggar, then Jaggar was taken over the lava flow in an amphibian to point out the desired targets. He pointed out two aiming points. Number one would be the first visible channel of lava flowing directly from the source through tunnels of solidified lava. Number two would be a mile downstream from the source at a point where the flow entered another tunnel to emerge again 200 yards below.

The first bombing plane took off at 8:45 a.m. on December 27, followed by four other bombers at 20-minute intervals. Each carried two sighting bombs and two demolition bombs.

Swinging a half mile above the lava source, at an altitude of 12,000 feet, each of the bombers dropped a practice bomb, then a 600-pounder. As the pilots watched, great fountains of liquid rock shot hundreds of feet into the air. The first shots blasted enough holes to form a flaming sluiceway of lava near the source of the flow sending it in a new direction. Then the airmen went after their second target, the tunnel which fed the lava river that menaced Hilo.

Upon completion of the first mission the planes returned to Hilo where they were refueled out of 50-gallon drums, loaded with more bombs, and sent aloft again. Again they attacked both targets. The Hilo flow, robbed of its steady pressure, slowed down immediately and the fliers returned to Hilo Airport. That night the sky was brilliantly lighted as crusts of lava tumbled into the liquid flow in the laked area. On the following morning the five planes which had bombed the flow and the five bombers which had not been needed returned to Oahu, their crews still uncertain of the extent of their success.

Some Hawaiians had scoffed at the idea of challenging the goddess Pele with aerial bombs. Some feared that her anger might be aroused as a result of this action and that she would retaliate by sending a new and greater flow of molten lava to destroy the city. Or perhaps she would take no notice whatsoever of the puny attempts of mere human beings to fight a rampaging volcano.

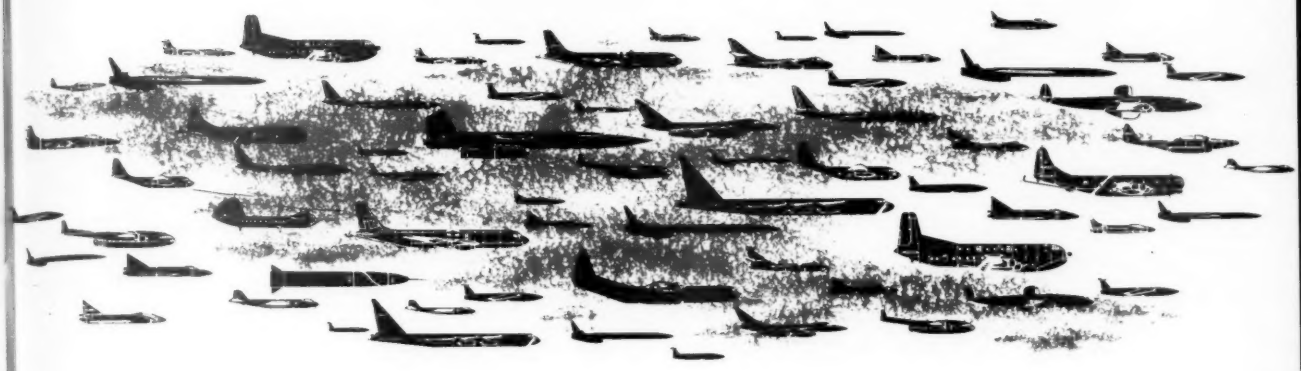
No one could deny, however, that for the time being, at least, the lava flow had stopped. Prior to the bombing the molten mass had been creeping toward the city at the rate of 800 feet per hour. Immediately after the bombing it had slowed to 150 feet per hour. It stopped entirely on December 28. Believers in the volcano goddess passed this off as coincidence, insisting that the lava would go or stop at Pele's command, regardless of the actions of men. A few pointed out that even Dr. Jaggar hesitated to call the bombing a complete success.

On January 2, after a thorough study of the situation, Dr. Jaggar did call it a success. In a letter to Col. Daniel Van Voorhis, Hawaiian Department chief of staff, he stated:

"The Air Corps in one day's work has stopped a lava flow which might have continued indefinitely and have caused incalculable damage to forest, water resources, and city.

"What is more important, the work of the bombing squadrons has demonstrated for the first time in history a new method in economic volcanology. And lastly, and what is most important of all, we have shown that cooperation between government departments can add much to the world's store of pure science and humanitarian engineering."

P-12 Pursuits



Statement by General Thomas D. White, Chief of Staff, United States Air Force before the Subcommittee on Disarmament, Senate Committee on Foreign Relations, 2 February 1959

EFFECTIVE and equitable solution to arms control problems in today's era of high performance weapon systems—which have compressed time, distance and destruction into such a violent package—would be a boon to mankind surpassing anything in history. However, the very fact that these factors have been so compressed imposes a greater demand for caution and deliberation in the consummation of arms control agreements than ever before. Finalized measures must be capable of positive and precise control and enforcement. Should anything less occur, this Nation's security and that of the Free World would be unacceptably compromised.

The philosopher, Spinosa once pointed out, "Peace is not absence of war, it is a virtue, a state of mind, a disposition for benevolence, confidence, justice." As members of this Committee, you gentlemen are most familiar with the trials and tribulations that men through the ages have faced in their efforts to attain lasting peace. Various methods have been employed in this endeavor. We have learned through experience that the "state of mind" to which Spinosa referred must be mutual and that mere expressions of intent and good will are insufficient. Positive tangible actions in the same direction must also be taken.

In recent years, concentrated effort has been exerted toward achieving the goal we all seek. I refer, of course, to measures taken to control arms after World Wars I and II and the Korean War. All of us here today know that these most recent efforts have met with little success.

After World War I and for a limited time after World War II this country could and *did* disarm. We led by example. We demonstrated our lack of aggressive intentions visibly to the entire world. We did this, secure in the knowledge that distance would protect us sufficiently to rearm in time if we were violated.

We know that this is not feasible today. This knowledge is the factor that makes caution mandatory. It is the reason that, over the last decade, this country has adopted a strategy of deterrence through possession of military power—or to put it differently, a policy of peace through strength.

During these past 10 years, our strategy of deterrence has been primarily reflected in the possession of nuclear weapons and strong airpower. It so exists today. I feel that this strategy must continue.

Airpower today, and aerospace power tomorrow, comprise the capability that has compressed time, distance and destruction into the compact violent package I referred to earlier. Likewise, it is that very same aerospace power which constitutes the primary military threat against us. As long as there is such a threat, we must maintain a counter force to serve as a deterrent. As the threat against us increases—and as the possibility of warning of surprise attack decreases—we must concomitantly improve our own counter force and our capacity to react quickly and decisively. As a military man—and from the standpoint of National survival—I see no other recourse under present conditions.

The military force structure of the United States is premised on one basic objective—defense, not aggression. I agree that it is a peculiar paradox that our "defense" is primarily based on a strong airpower offensive, but we cannot take a chance on risking our survival solely on a defense system which might some day be found wanting in the face of an overwhelming offense. Consequently, the only plausible course of action is to possess forces which deter an enemy through his fear of the consequences to him should he attack.

I am convinced that peace today is due in great part to the military strength which the United States has in hand. Peace tomorrow will likewise depend upon such strength *unless* the threat to our security and that of the free nations is withdrawn. Our only guarantee to continued freedom is to assure that we make no move to reduce our strength without a comparable reduction in that threat.

R_e = Radius of Earth

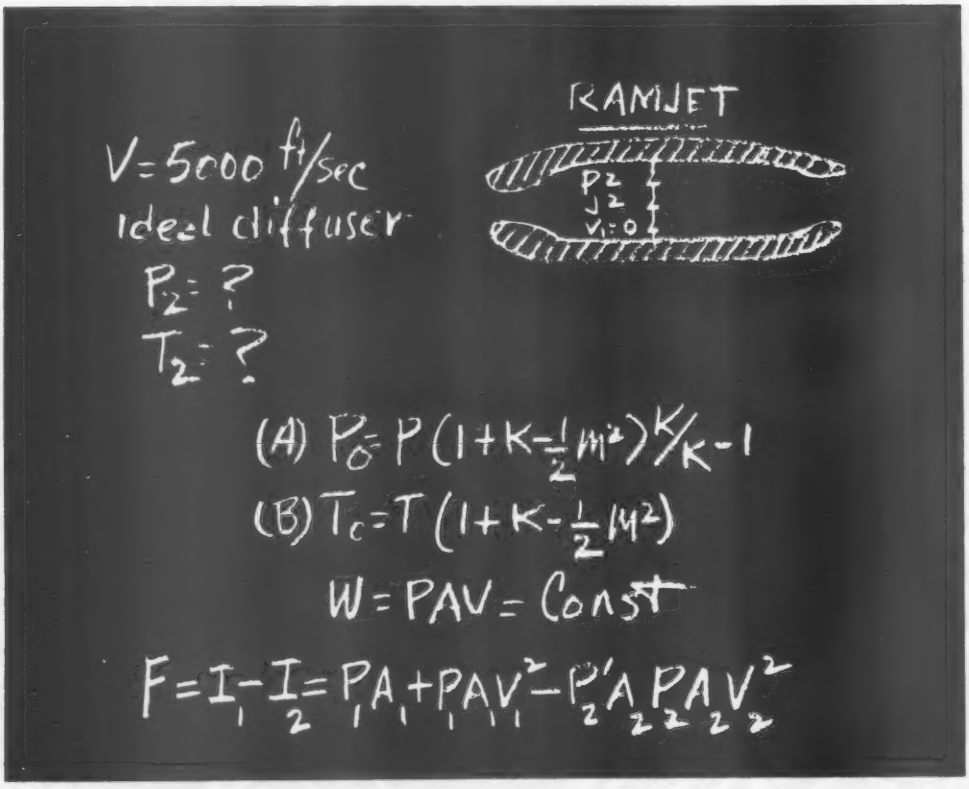
R = distance to Earth's center

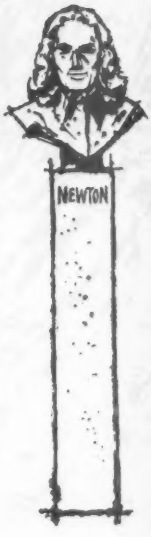
h = altitude of missile (distance in nautical miles)

v = linear (or tangential) velocity in knots

w = angular velocity in radians

θ = angle created in traveling from x to x'


RAMJET
V = 5000 ft/sec
ideal diffuser
P2 = ?
T2 = ?
P2
J2
V1 = 0
(A) $P_0 = P(1 + K - \frac{1}{2}M^2)^{K/K-1}$
(B) $T_c = T(1 + K - \frac{1}{2}M^2)$
W = PAV = Const
$F = I_1 - I_2 = P_1A_1 + P_1AV_1^2 - P_2'A_2P_2AV_2^2$



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See page 35 and AFR 53-11

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